OVERHEAD
MATERIAL HANDLING
EQUIPMENT

THE
AMERICAN MONORAIL CO.
CLEVELAND, OHIO

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AMERICAN MONORAIL
OVERHEAD
CONVEYING SYSTEMS

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CATALOG B

THE AMERICAN MONORAIL COMPANY

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INTRODUCTION

AMERICAN MonoRail, in itself, as an Overhead Conveying System needs no introduction to the manufacturing executive or industrial engineer who has to deal with the handling of materials.

However, development and improvement go on without stop or pause, and this catalog has been compiled to present, along with tested, standard equipment, those outstanding changes in design and construction which have increased the efficiency of MonoRail, together with the new equipment which has greatly widened the possibilities of its application to the handling of materials throughout all industry.

A careful reading of this catalog will repay any who have materials to be moved, since the solutions of many handling problems are illustrated in its pages. Here will be found engineering data also, valuable to engineers who are making plans for the mechanical handling of the raw materials, products in process, and the finished production of their plants.

MAR 11 1932 MBW 2

GUARANTEE

The American MonoRail Company guarantees without qualification the materials and workmanship entering into the manufacture of its products,

a. and will deliver to the customer's plant any part which fails due to defect in material or workmanship within the first year of its operation;

b. that the American MonoRail Company will assume responsibility for repair or erection charges, due to replacements, or changes in the system, only where such repair or erection work shall have been previously authorized and approved;

c. that the American MonoRail Company owns its own patents on designs, that its product is free from patent infringement, and that it will protect its customers accordingly.

THIS CATALOG presents, in as complete a form as is possible with ink and paper, what American MonoRail **Is** and **Does.** It cannot, however, go into your plant and point out the money-making, labor-saving, and time-conserving applications of its tested and tried equipment.

That is the task of a MonoRail engineer, one of an organization made up of men who have been identified with materials handling since the very earliest applications of the MonoRail principle to industrial transportation.

May we have one of these men see you?

That Additional Factor of Safety!

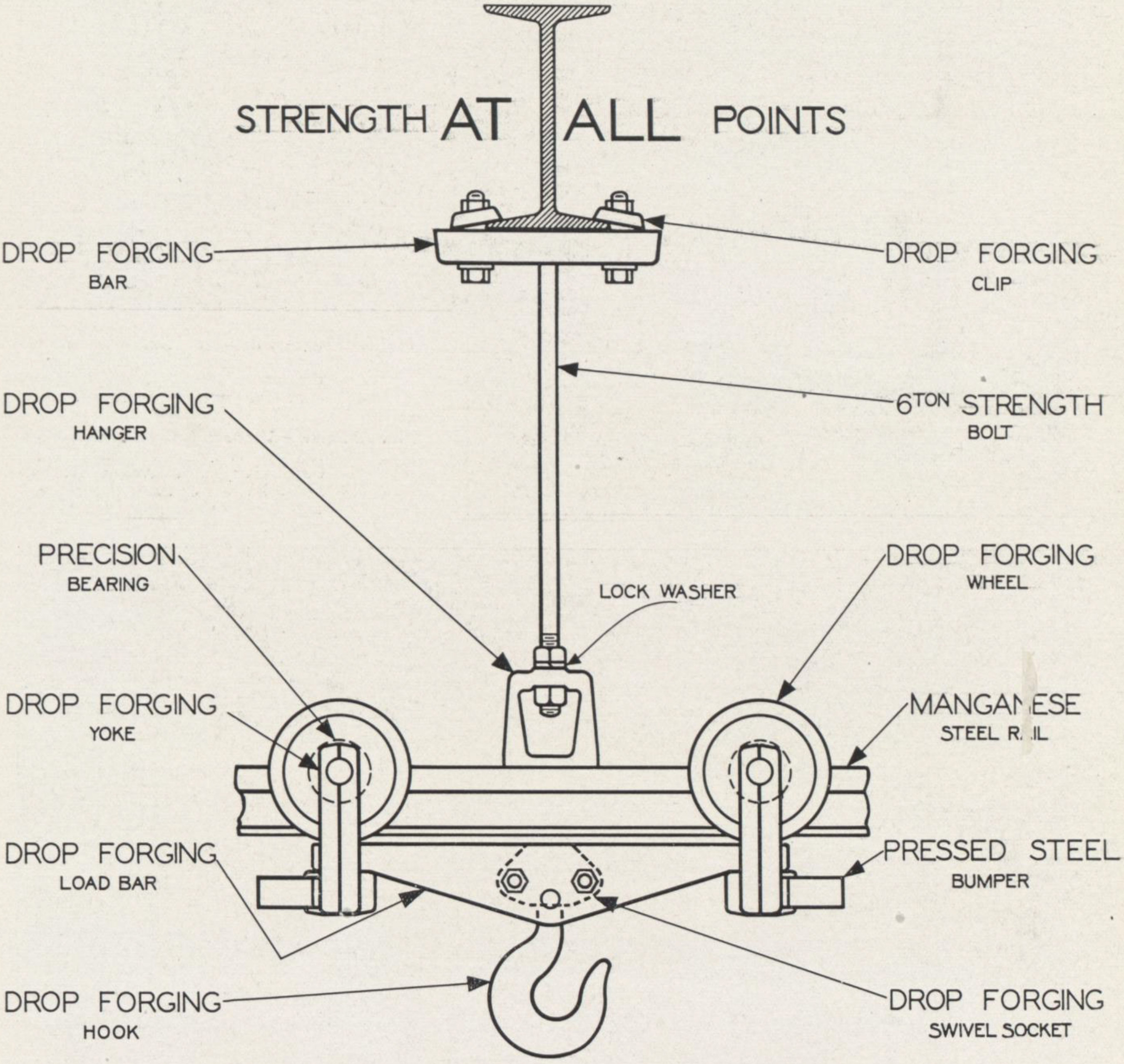


Fig. 5

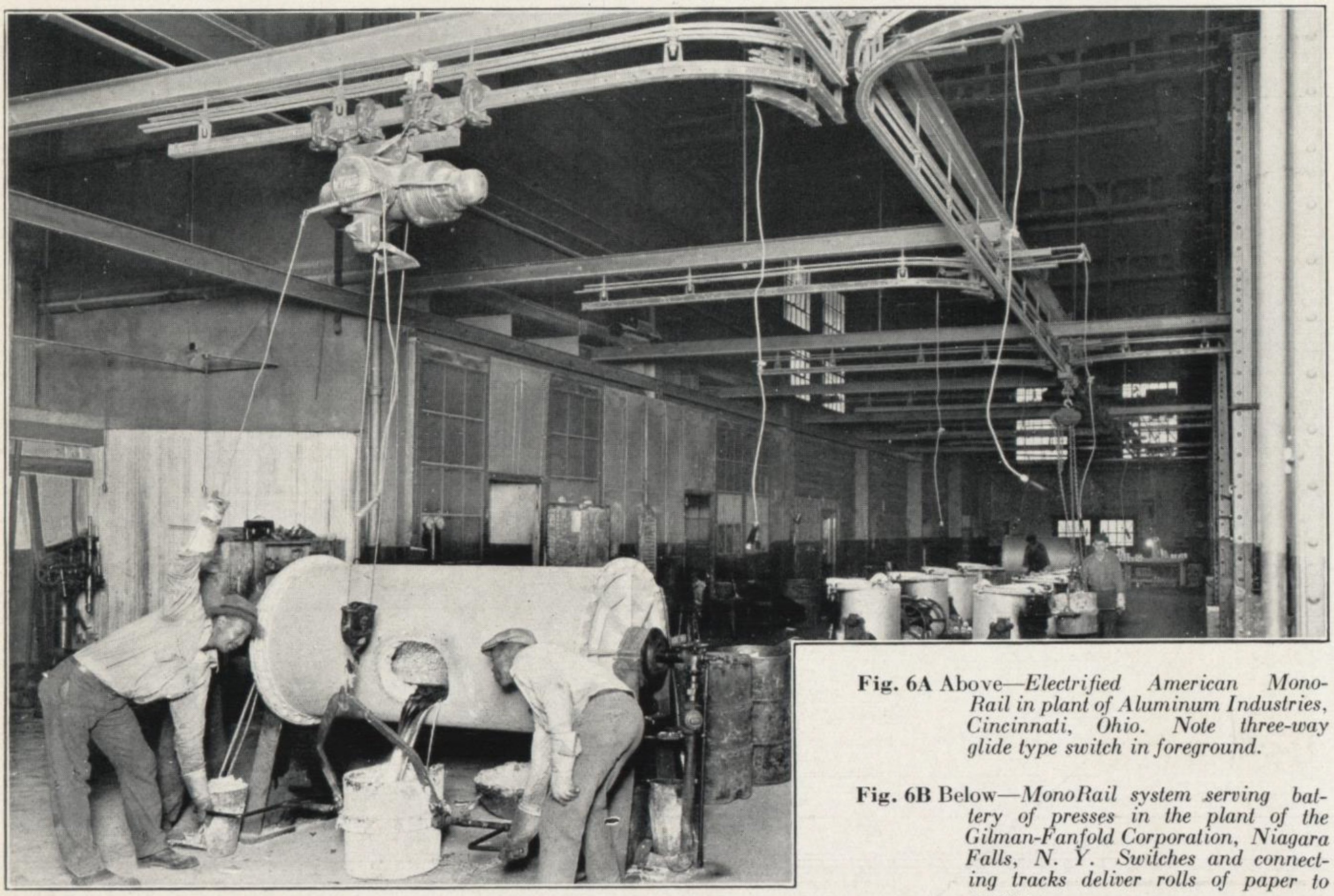
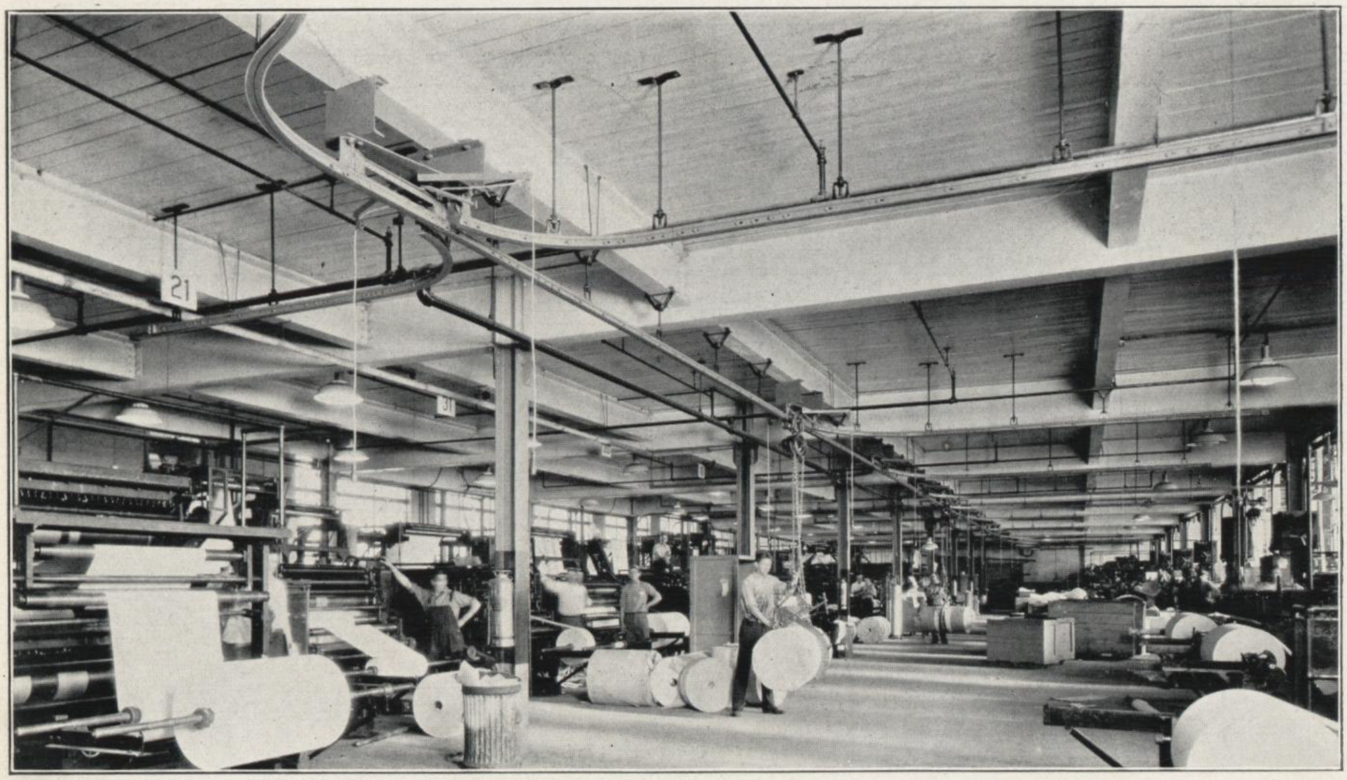


Fig. 6A Above—*Electrified American MonoRail in plant of Aluminum Industries, Cincinnati, Ohio. Note three-way glide type switch in foreground.*

Fig. 6B Below—*MonoRail system serving battery of presses in the plant of the Gilman-Fanfold Corporation, Niagara Falls, N. Y. Switches and connecting tracks deliver rolls of paper to presses.*



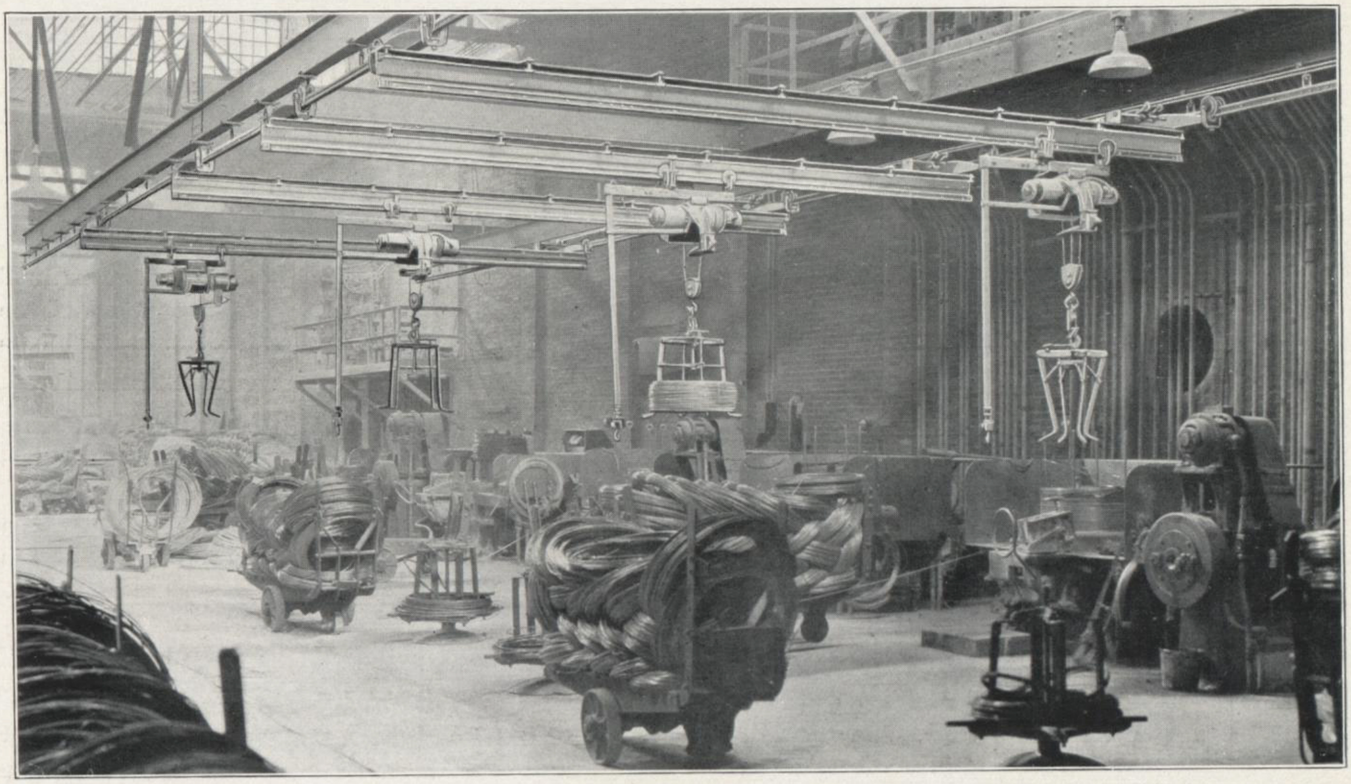


Fig. 7A *MonoRail stripping cranes in wire mill at the Jones & Laughlin plant at Aliquippa, Penna.*

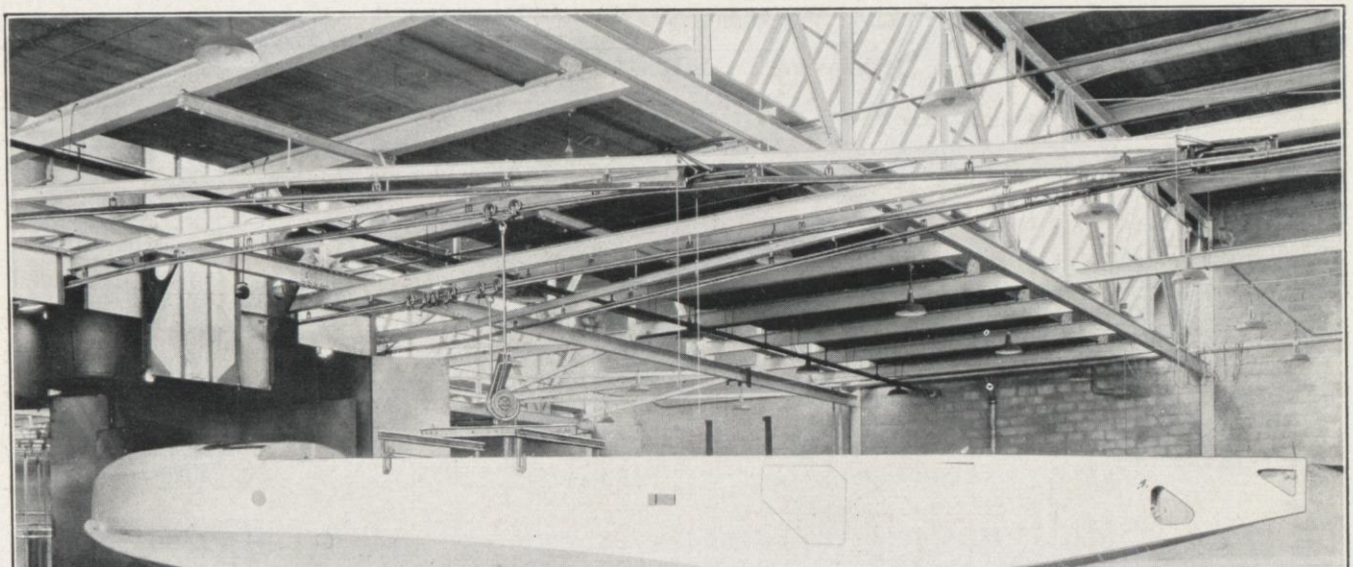


Fig. 7B *Flying boat hull supported by American MonoRail at entrance to spray booth in plant of the Glenn L. Martin Corp., Baltimore, Md.*

A Graphic Presentation of American MonoRail Design

The illustrations on this and the following page visualize some of the outstanding advantages in engineering that are incorporated in the design of American MonoRail.

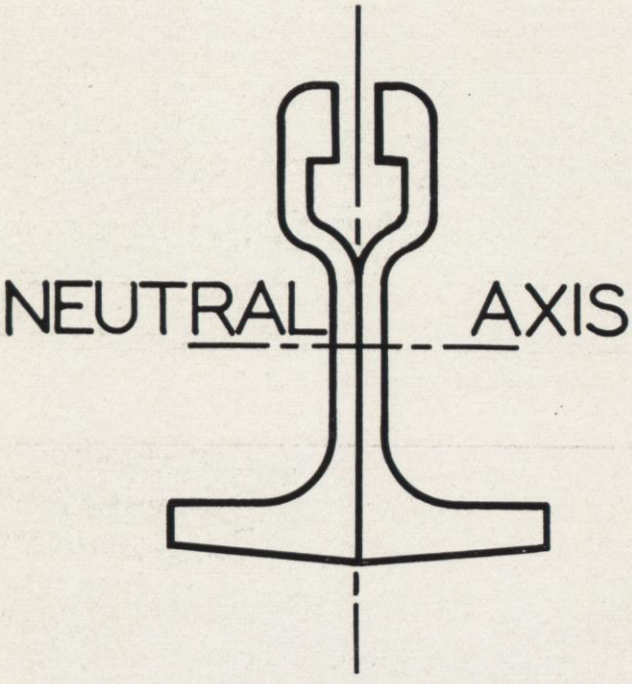


Fig. 8A

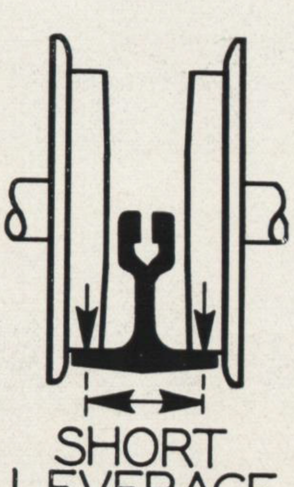


Fig. 8B

They show graphically the reasons for the unusual strength of the rail section, the compactness of the entire system, the saving in headroom, and the ease of manipulating rail for desired curves and bends.

●

MATERIAL STRENGTH

The specifications covering the steel used are given on page ten, and in themselves account for the basic material strength of the MonoRail section.

●

SECTIONAL STRENGTH

The great strength of American MonoRail is due not only to the unusual quality of the steel used, but it is also the result of mechanically balancing the rail section by placing approximately as much steel in the head of the rail as is used in the flanges. By balancing the section and disposing of as large a part of the metal as possible near the extreme top and bottom, maximum carrying capacity is obtained because the metal in the section is working to the greatest possible advantage. Fig. 8A.

●

NARROW FLANGES

The narrow flanges on MonoRail track permit bringing the trolley wheels close in to the web of the rail. This enables the metal in the flanges to do the maximum amount of work as a load-carrying beam rather than in resisting flange stresses caused by loads carried at a greater distance from the web. Fig. 8B.

●

Compactness throughout the line is secured from the design of the rail section.

It reduces bending stresses in trolley yokes. See Fig. 9A.

It reduces necessary clearances and overall dimensions of switches, turntables, cranes, and other trackage items, permitting shorter curves, with ample clearances in close quarters.

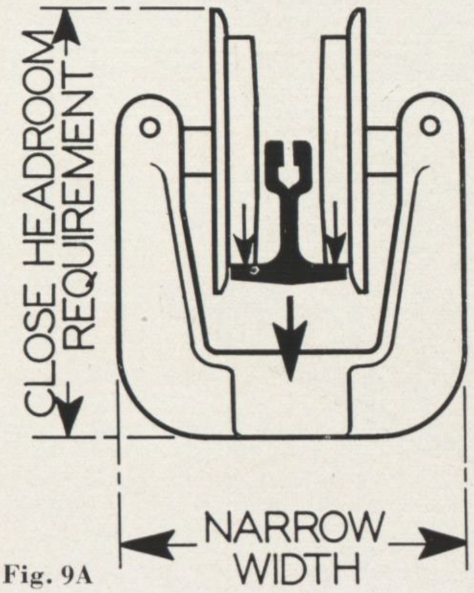


Fig. 9A

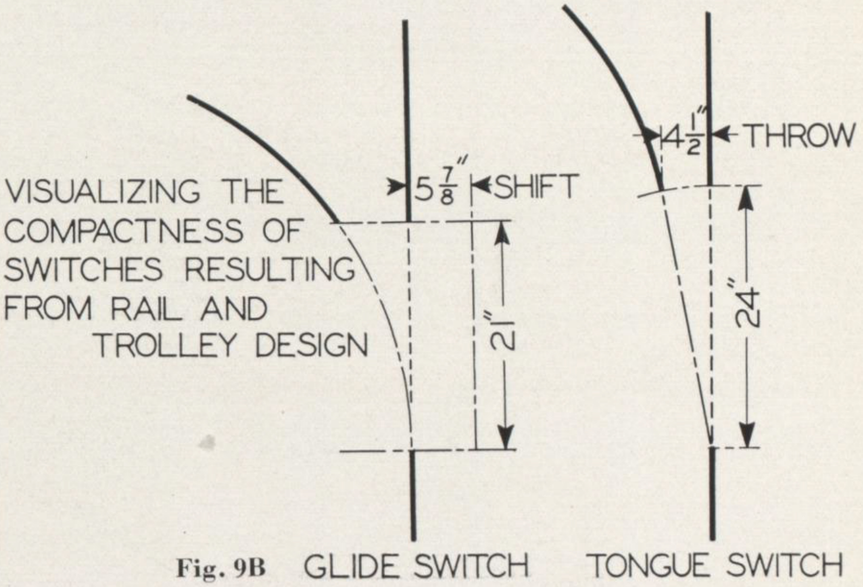

VISUALIZING THE COMPACTNESS OF SWITCHES RESULTING FROM RAIL AND TROLLEY DESIGN
5 7/8"
SHIFT
21"
4 1/2"
THROW
24"
GLIDE SWITCH
TONGUE SWITCH

Fig. 9B

It reduces materially the dead weight, in cranes and other carriers, that must be moved about in handling given loads.

It provides for a maximum saving in headroom, which allows minimum height for new buildings where inches mean dollars, and which, in the case of existing structures, may be the deciding factor which secures to the user all the advantages of an American MonoRail Overhead Material Handling System.

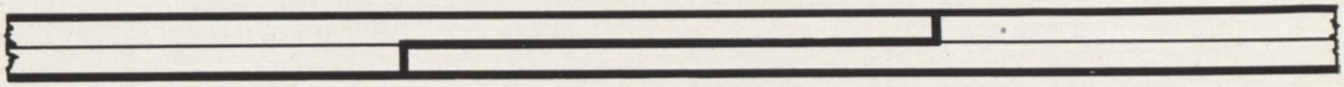


Fig. 9C

The long lap splice presents an unbroken flange for trolley travel on one or the other side of track at all points.

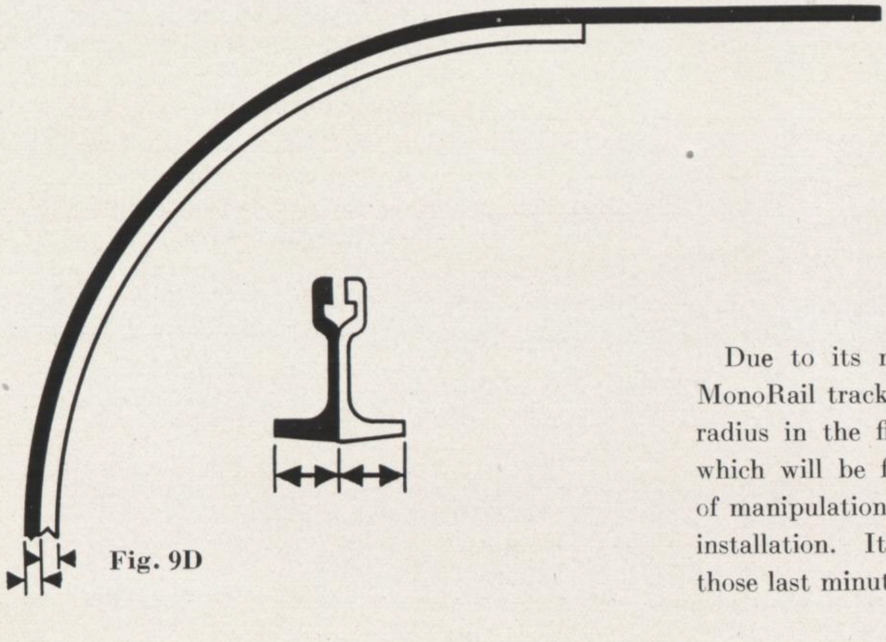
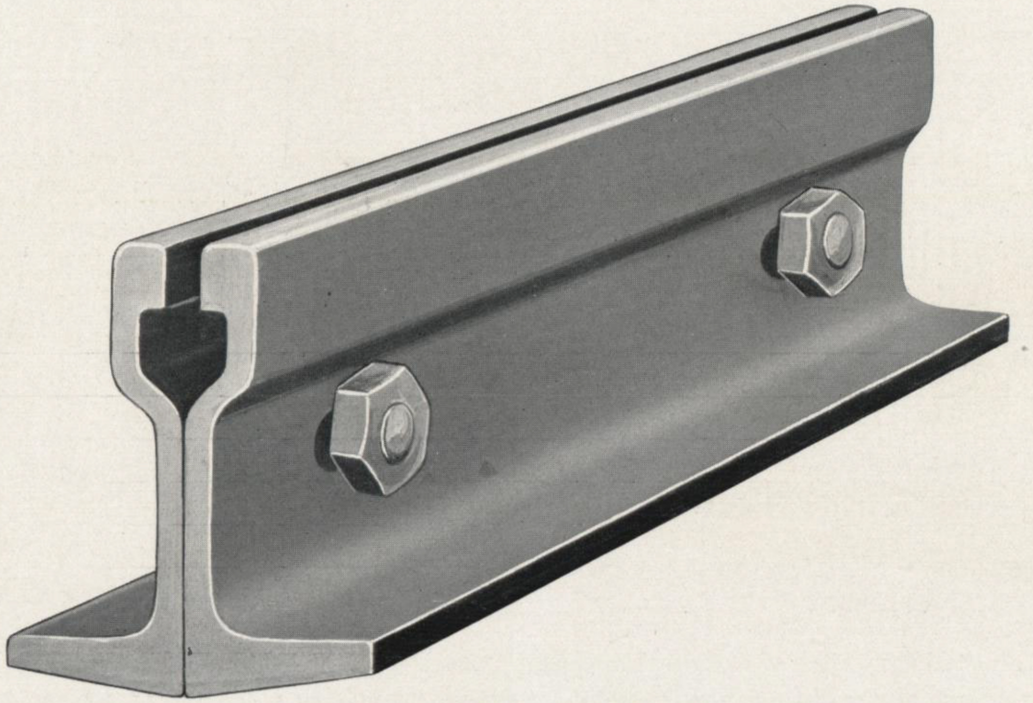


Fig. 9D

Due to its narrow flanges, the twin section of MonoRail track may be easily bent to any required radius in the field by the use of the Rail Bender which will be furnished when required. This ease of manipulation is reflected in substantial savings in installation. It also makes easy and inexpensive those last minute changes in track arrangement.



No. 401 American MonoRail - The Track

Specifications

Re-rolled railroad steel, which meets the American Society for Testing Materials rigid specifications No. A-16-14, which call for a tensile strength of 80,000 lbs. to the square inch and a yield point of 50,000 lbs. to the square inch.
Rolled from 5″ rail, 80-pound or over.
Carbon Range, from approximately .45 to .65.
Manganese, .60 to .90.
Silicon, approximately .15.
Phosphorous, less than .04.
Average Brinell hardness 213.
Twin sections bolted together, back to back.
Clamping bolts, spaced 12″ on centers.
Clamping bolts and nuts special heat treated.
Bolts and nuts securely locked.
Width of rail at lower flange, 2″.
Height over all, 2½″.
Minimum thickness of web, $\frac{9}{32}''$.
Furnished in standard lengths, 6, 8, 9, 10, 12, 15 and 16 ft.
Finish: Green Enamel.
Weight, 4.7 pounds per foot.

A rail in which every ounce of steel gives the greatest load carrying capacity, the material used being high grade railroad rail steel, re-heated and re-rolled. It is the toughest and finest material that can be obtained for a job where a combination of strength and resistance to rolling wear is required.

The assembled rail is made up of twin sections bolted together back to back to form a solid unit. The exceptional strength of the rail is due to the design and to the high quality of steel used, the lap splice and the added strength provided by the Drop Forged steel hanger. The flanges are heavy and will never bend down under any load carried on the trolleys. The rail has a balanced section, the head of the rail being a mass of steel equalling the weight of the flanges, while the web has a minimum thickness of $\frac{9}{32}''$.

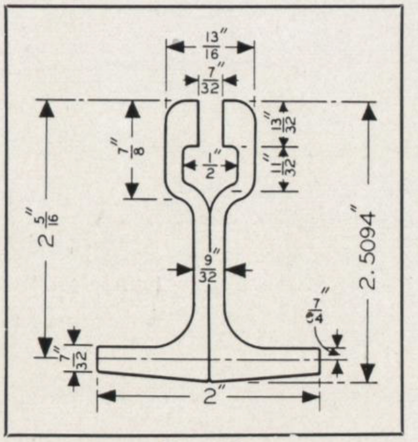


Fig. 10

If any section of American MonoRail track fails or breaks in any service within its rated capacity, a duplicate section will be delivered to the customer's plant without cost.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Rail Clamping Bolts

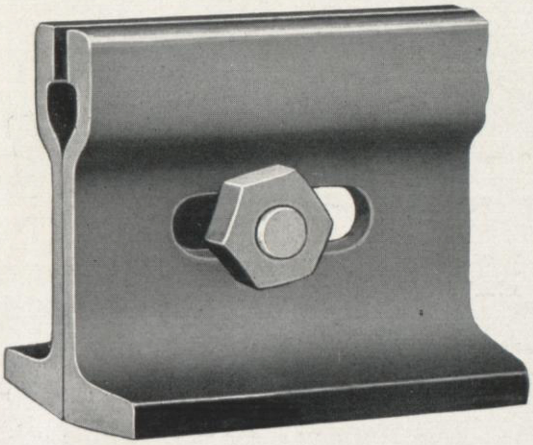


Fig. 11A
Rail Clamping Bolts in Place in Rail.

The automatic, positive, locking feature of the nuts and heads of MonoRail clamping bolts is unique. The bolt head and nut bind against the fillet or swell of the rail head. This does not prevent drawing the nuts tight with a wrench, but the binding resistance is sufficient to lock the bolt and nut securely in place. The bolts are specially heat-treated to secure a surplus of tensile strength. The bolt heads will not break off nor will the threads strip.

The bolts are seated in slotted holes and are not subject to shear stress in service or when rail is bent. The clamping bolts are placed in the rail on 12-inch centers except at splicing points, where additional bolts are used. (See Fig. 12, Page 12).

Rail Section with Forged Hanger in Place

The Drop Forged track hangers are clamped solidly inside the rail head. The rail has a tremendous grip on the hanger which prevents all tendency toward "creeping". The inside overhang of the rail head rests on the projecting shoulders of the forged hanger. The hanger at this point is 3¼″ wide and has a carrying capacity far beyond maximum ratings.

While the hanger is clamped solidly in place, its position can be changed or shifted in either direction by driving it with a hammer, without danger of damage. It is not necessary to loosen bolts or nuts to change the position of the hanger. Trolley wheels cannot strike against hangers clamped inside instead of outside the rail head, and have perfect clearance, even in going around curves of shortest radius.

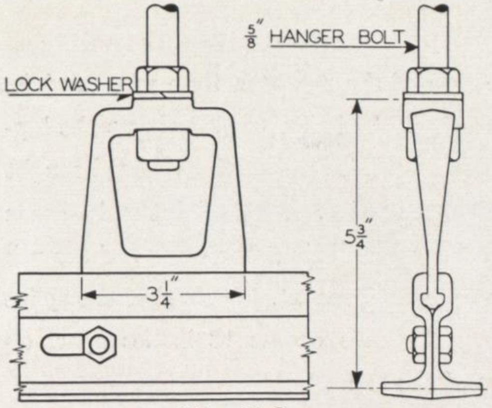


Fig. 11C

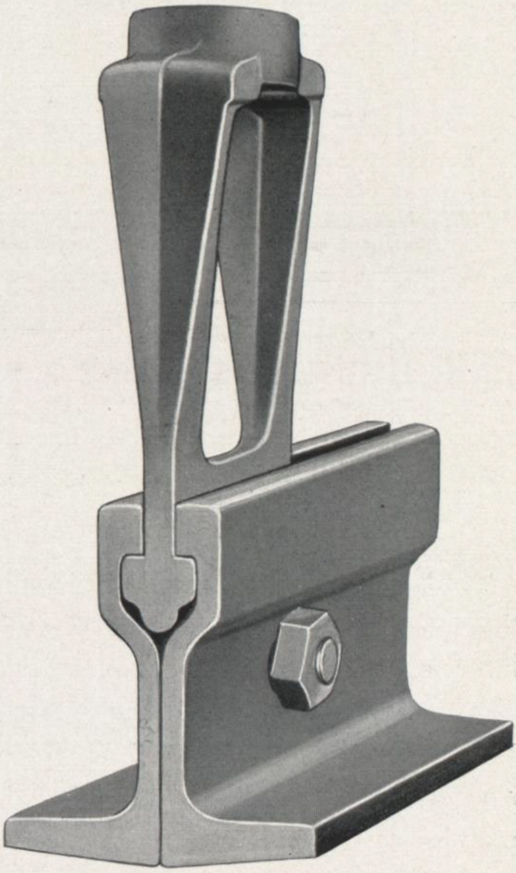
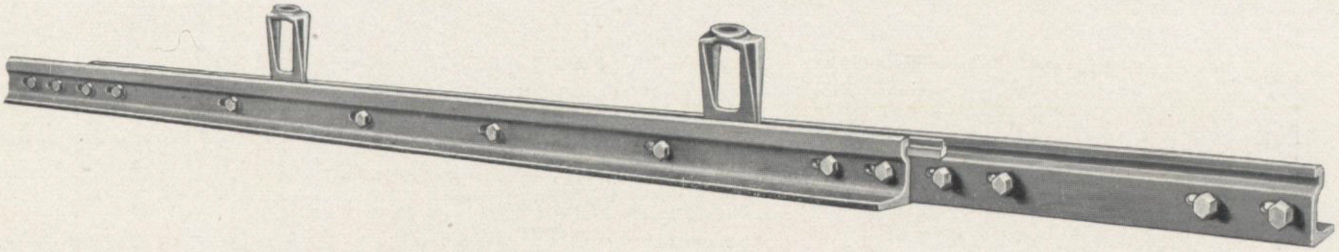


Fig. 11B
Rail Section with Forged Hanger in Rail.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 401 Assembled MonoRail

MonoRail is assembled for shipment with hangers clamped in rail head. The illustration also shows the lap at end for splicing onto the meeting rail. The clamping bolts used at each splicing point are so spaced that when necessary to bend the assembled rail in the field, there are always matching holes for the clamping bolts. The slotted holes in which bolts are seated prevent any shear stress on the bolt when rail is bent. Clamping bolts are placed in the end lap ready for the splice, and when the splice is made and the nuts drawn tight, they are automatically locked and will never work loose.

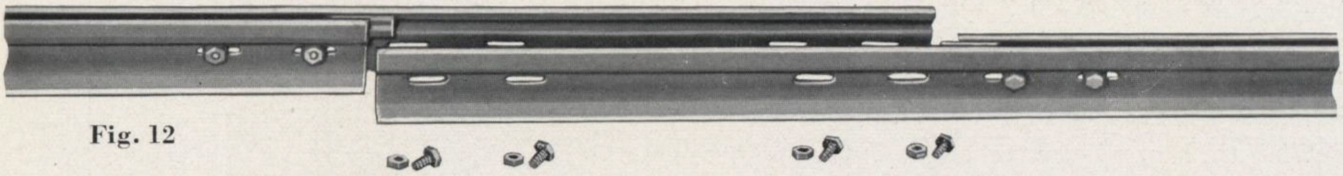


Fig. 12

Splicing Method

The lap splice in the MonoRail system eliminates the use of splice clamps, staggers the joints, gives the runway the strength of a continuous rail, and does away completely with the roughness of a "butt" joint. In this way MonoRail has overcome the handicap of the "butt" joint which has always been regarded as the weak point in overhead track systems. The wheels on trolleys pass over the splicing point on one side of the rail at a time without jolt, or jar, or vibration. This illustration shows the lapping ends of two assembled rail sections being brought together to form the splice. At the joint will be seen the alignment lug which brings the treads of the rail into perfect vertical alignment. Note that the splice break in the rail flange occurs 18 inches apart on opposite sides of the rail.

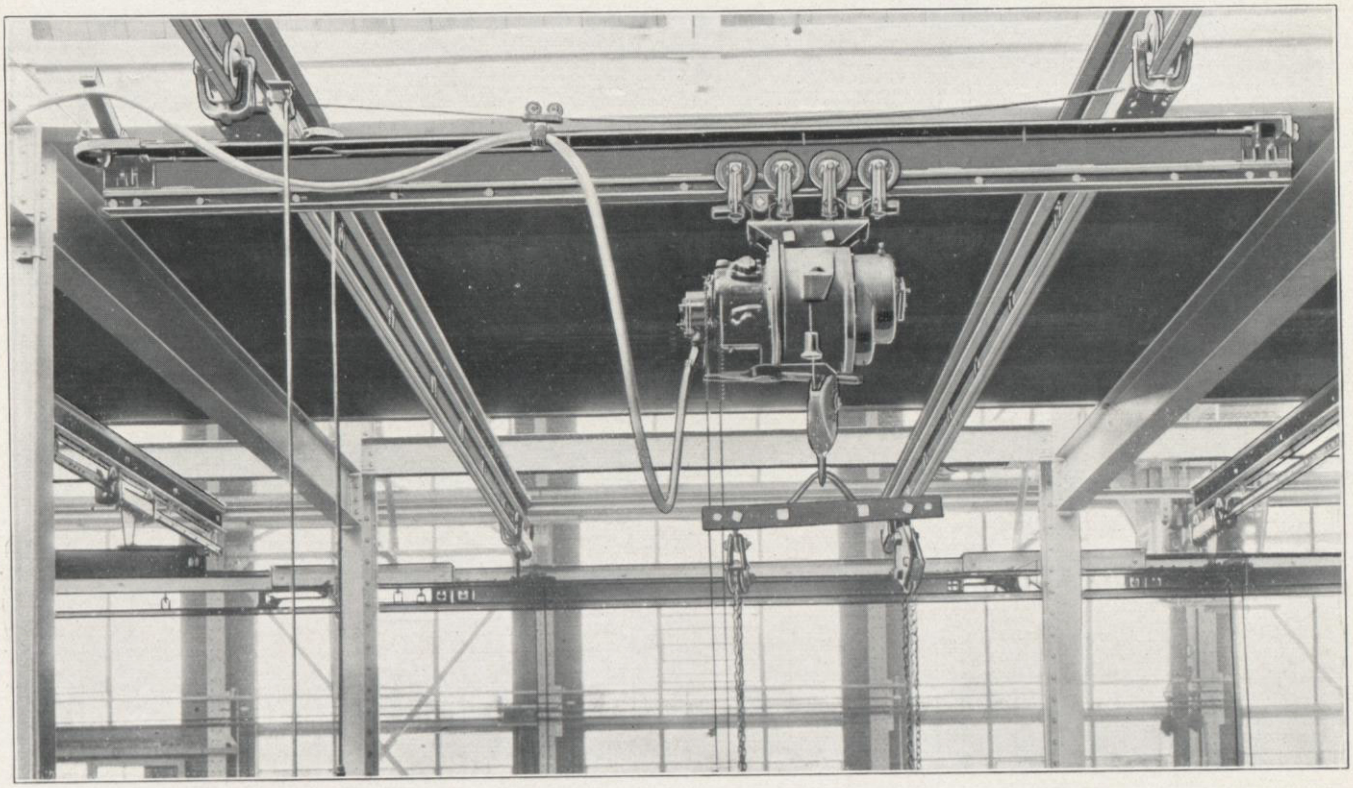


Fig. 13A *American Girder Rail as used for crane bridge in the Lebanon Steel Foundry, Lebanon, Pa. Crane carries one-ton air-motor hoist on special hook-up to trolley.*

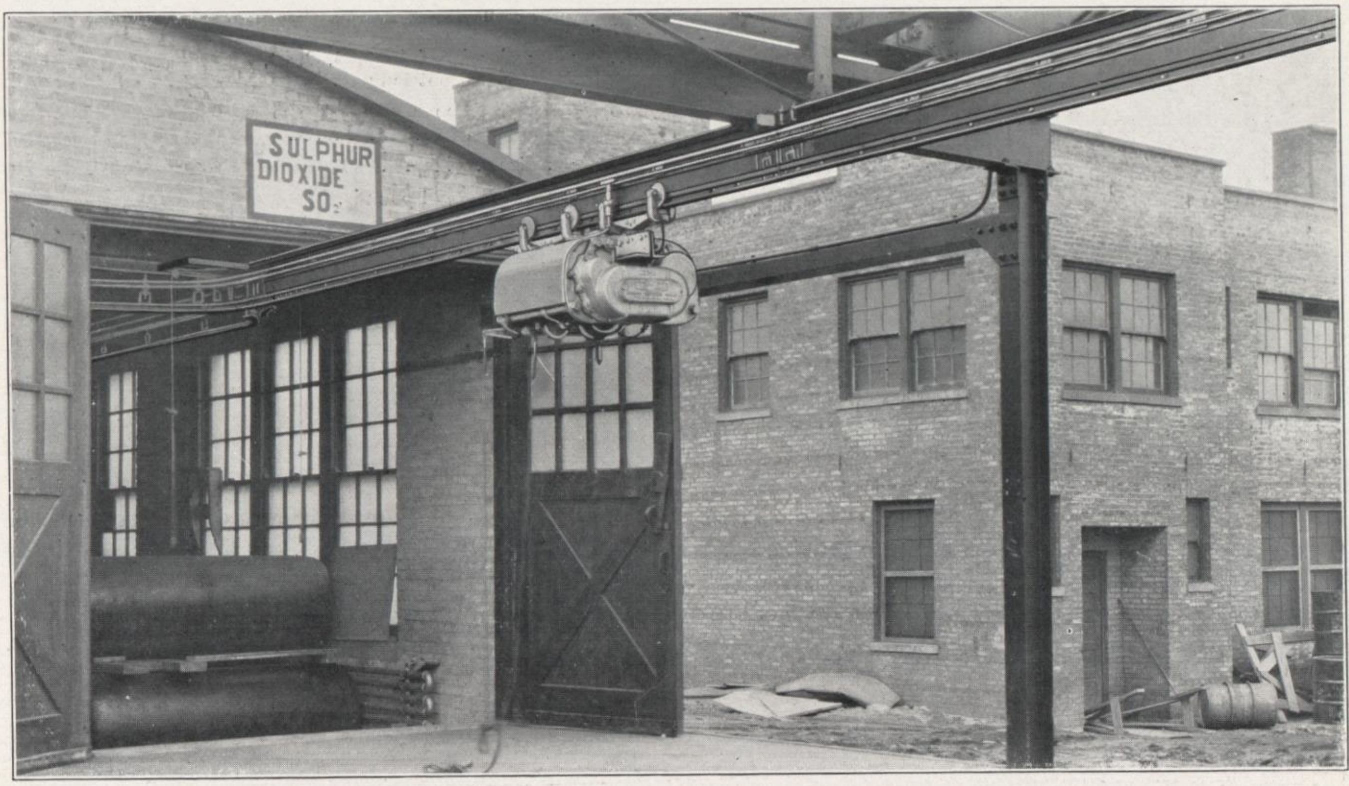
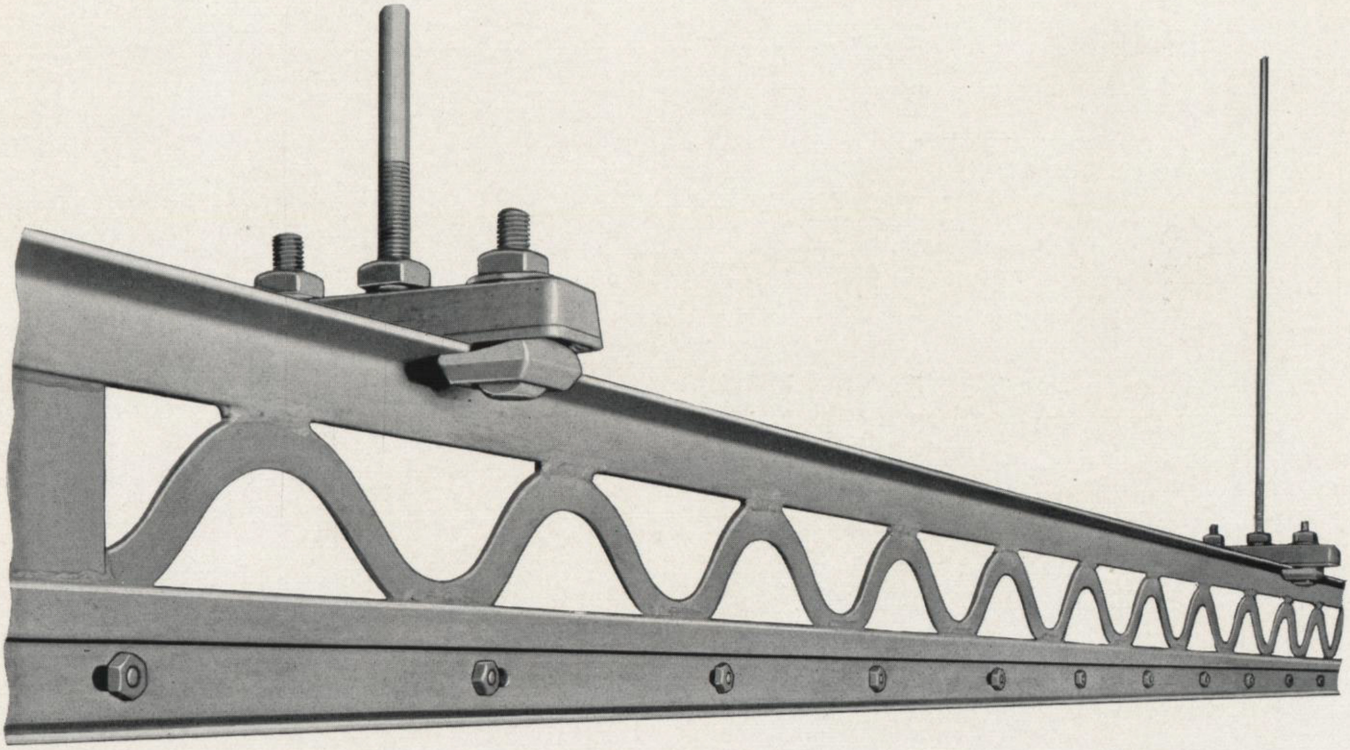


Fig. 13B *American Girder Rail bridging gap between outside crane and MonoRail system in chemical storage room of large refrigerator manufacturer. Note also American Girder Rail used as crane bridge. System electrified for hoist.*



No. 434 American Truss Rail

Specifications

Lower Chord: Standard MonoRail.

Upper Chord: Two structural angles, 2" x 1½" x ¼".

Trussing Member: Mild steel section, ¼" x 1".

Solidly joined by arc welding.

Lengths: Furnished in 6, 8, 9, 10, 12, 15 and 16 foot lengths.

Used for straight runs only and in combination with standard curves.

Finish: Green Enamel.

Weight per foot, 11 pounds.

American Truss Rail is a welded assembly consisting of a lower chord of Standard MonoRail and an upper chord of two angles back to back, joined by a specially formed web member which forms a true truss.

This furnishes a stiff, strong track unit which provides for long spans where superstructure would otherwise be necessary. It is adapted for use as crane runways and other applications which do not require the load capacity of American Girder Rail.

American Truss Rail is much lighter than a combination of Superstructure and standard MonoRail; its use greatly reduces erection cost as there is only a single unit to handle and put up. It is neat in design, provides maximum headroom and is economical in first cost.

The method of splicing Truss Rail, illustrated below, provides for smooth, strong, continuous trackage by the same long lap splice that is used in standard MonoRail.

Detailed information on the use of Truss Rail is given on pages 16, 176 and 177.

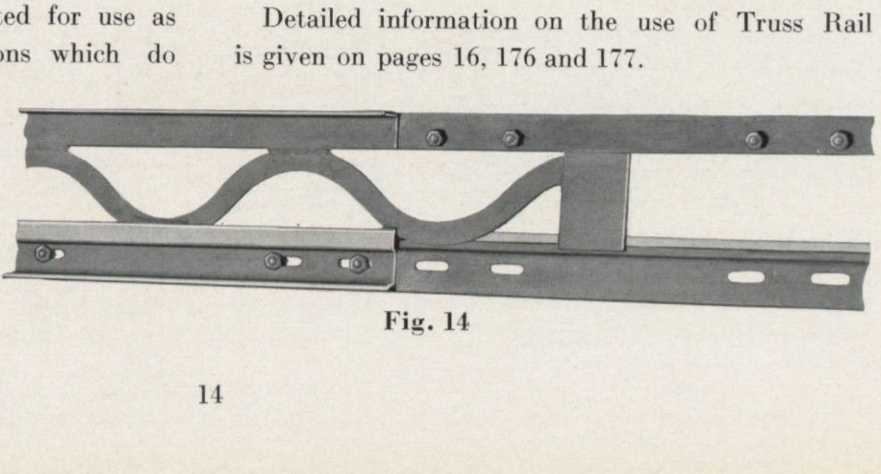
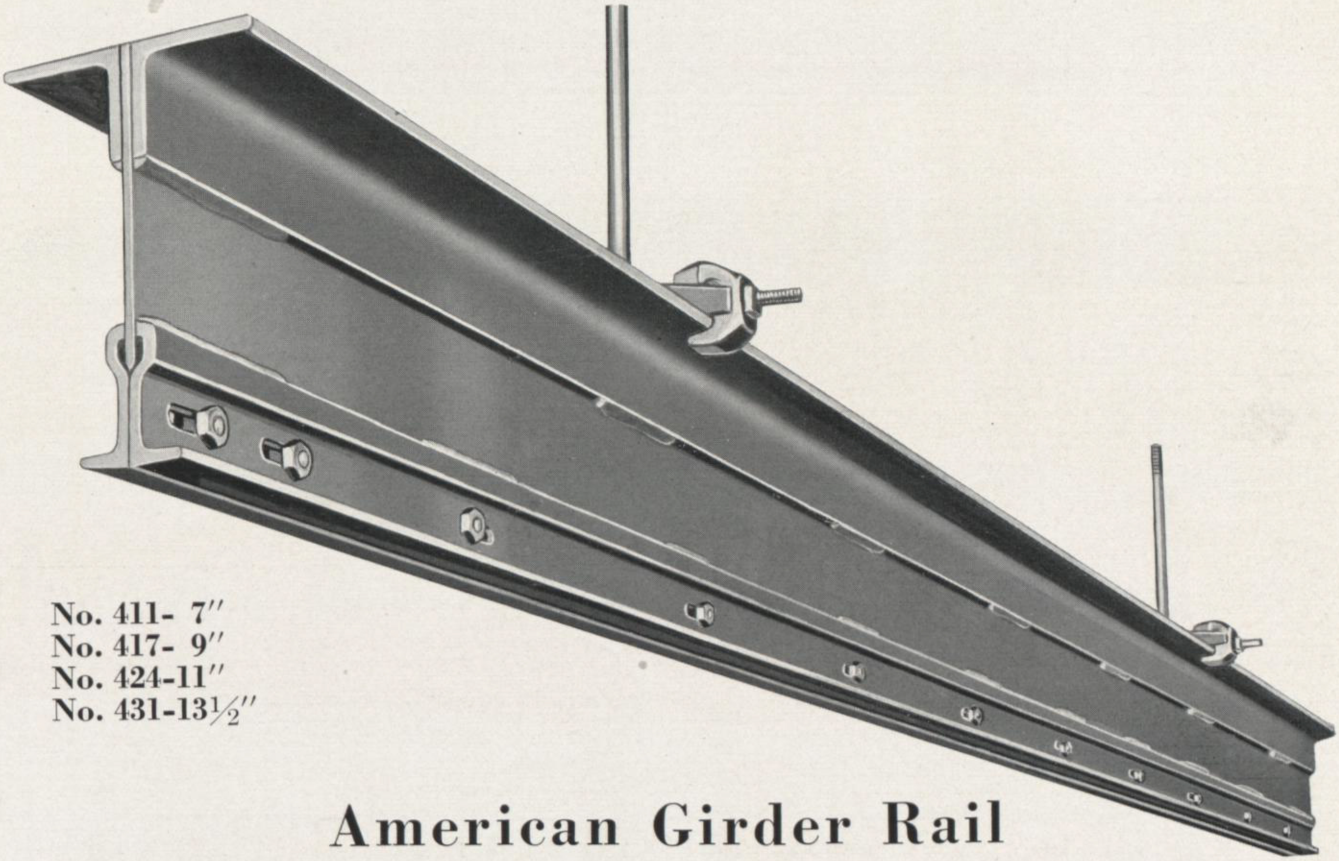


Fig. 14



No. 411- 7″
No. 417- 9″
No. 424-11″
No. 431-13½″

American Girder Rail

Specifications

Construction: Same as Truss Rail except that upper angles are heavier and web is a solid steel plate $\frac{3}{16}''$ in thickness.

Solidly joined by arc welding.

Lengths: Furnished in 10, 12, 14, 16, 18 and 20 feet, or fabricated to fit the job.

Depth: Furnished in 7, 9, 11 and 13½ inch depths.

Used for straight runs only, and with standard curves.

Finish: Green Enamel.

American Girder Rail has been developed to meet situations where widely spaced building superstructure members make necessary long unsupported spans in overhead trackage. Girder Rail is also used for bridge members of MonoRail cranes of various types; for track sections of MonoRail scales; track sections of MonoRail lifts, and similar applications where maximum strength must be combined with the utmost stiffness.

To the inherent great load-bearing capacity of standard MonoRail track has been added the support of a steel plate web, and the stiffening of two structural angles, electrically welded together. Thus we have embodied superstructure and track in one homogeneous unit.

Where it is necessary on long runs of track to splice American Girder Rail, the method of splicing shown below provides a union, with a generous lap, between two sections, that is almost as strong and stiff at the point of junction as the remainder of the track.

Data in tabular form, giving desired information on girder rail will be found on page 16. See also pages 176 and 177.

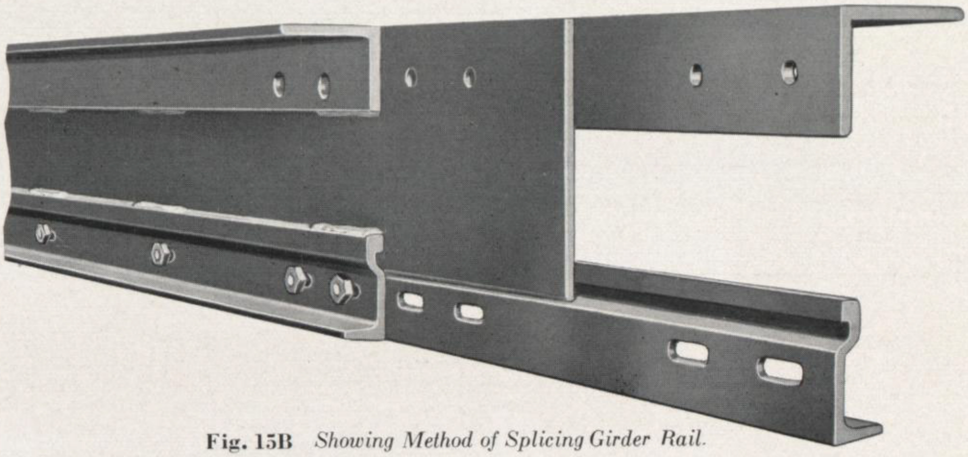


Fig. 15B *Showing Method of Splicing Girder Rail.*

American Truss and Girder Rail

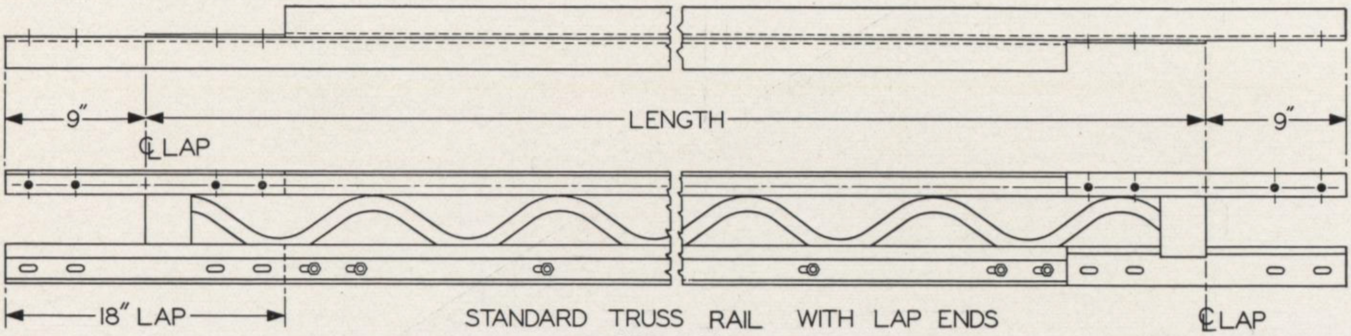


Fig. 16A

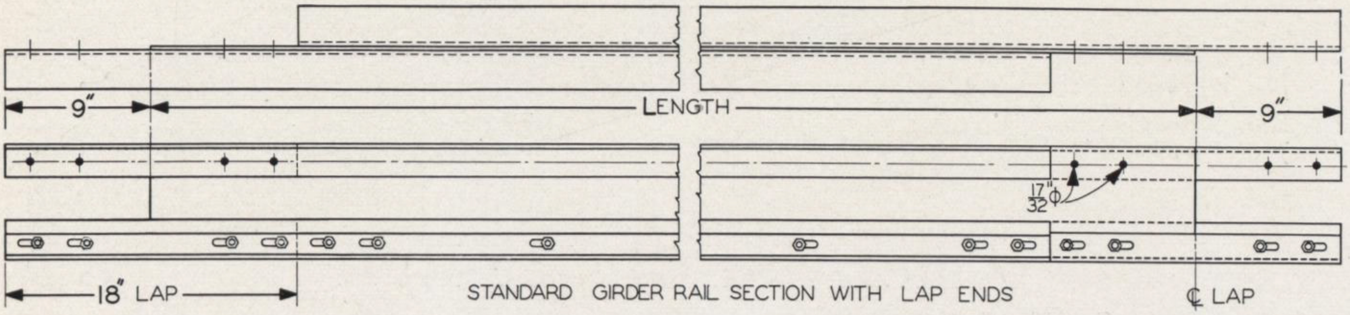


Fig. 16B

TRUSS AND GIRDER RAIL LOAD TABLE

For single unbraced spans uniformly loaded*

TYPE & DEPTH	WEIGHT PER FOOT	UPPER FLANGE WIDTH	SPANS IN FEET											
			8′	10′	12′	14′	16′	18′	20′	22′	24′	26′	28′	30′
7″ TR	11.4	4″	8320	6100	4500	3420	2160	1340						
7″ TR	12.3	5″	8880	6900	5260	4320	3200	2200	1400					
7″ GR	14.6	5.19″	9600	7540	5780	4500	3500	2820	2000	1240				
7″ GR	16.4	6.19″	9780	7820	6300	5020	4020	3320	2740	2040	1260			
9″ GR	17.7	6.19″	14000	11200	9020	7200	5760	4780	3940	2900	1800			
9″ GR	21.7	7.19″	14800	11840	9880	8200	6660	5720	4680	4000	3400	2540	1620	
11″ GR	22.9	7.19″	19900	15900	13060	11000	8940	7540	6280	5380	4560	3400	2180	
11″ GR	25.1	8.19″		16120	13440	11520	9600	8140	6960	5920	5120	4400	3820	2840
13½″GR	26.7	8.19″			18180	15580	13240	11040	9440	8040	7960	5960	5180	3860
13½″GR	28.7	10.19″				17920	15680	13920	12120	10500	9160	8120	7160	6400

*For single spans, unbraced, with concentrated loads use one half the tabular loads in the above table.

For strength of supporting connection to upper flanges see page 176, Fig. 176B.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

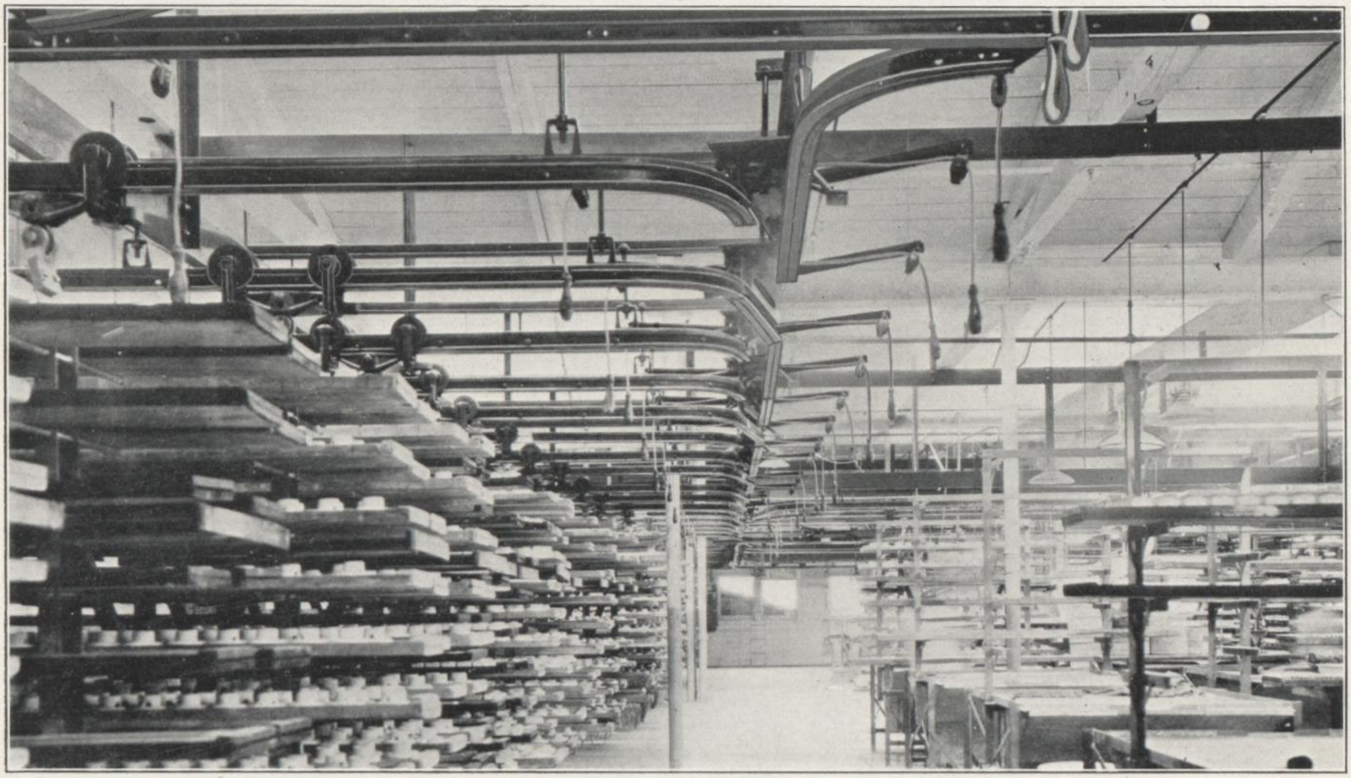


Fig. 17A *Part of an extensive MonoRail system in the plant of the Washington Porcelain Company, Washington, N. J. Close spacing of storage tracks was secured by the short radius curves with MonoRail switches.*

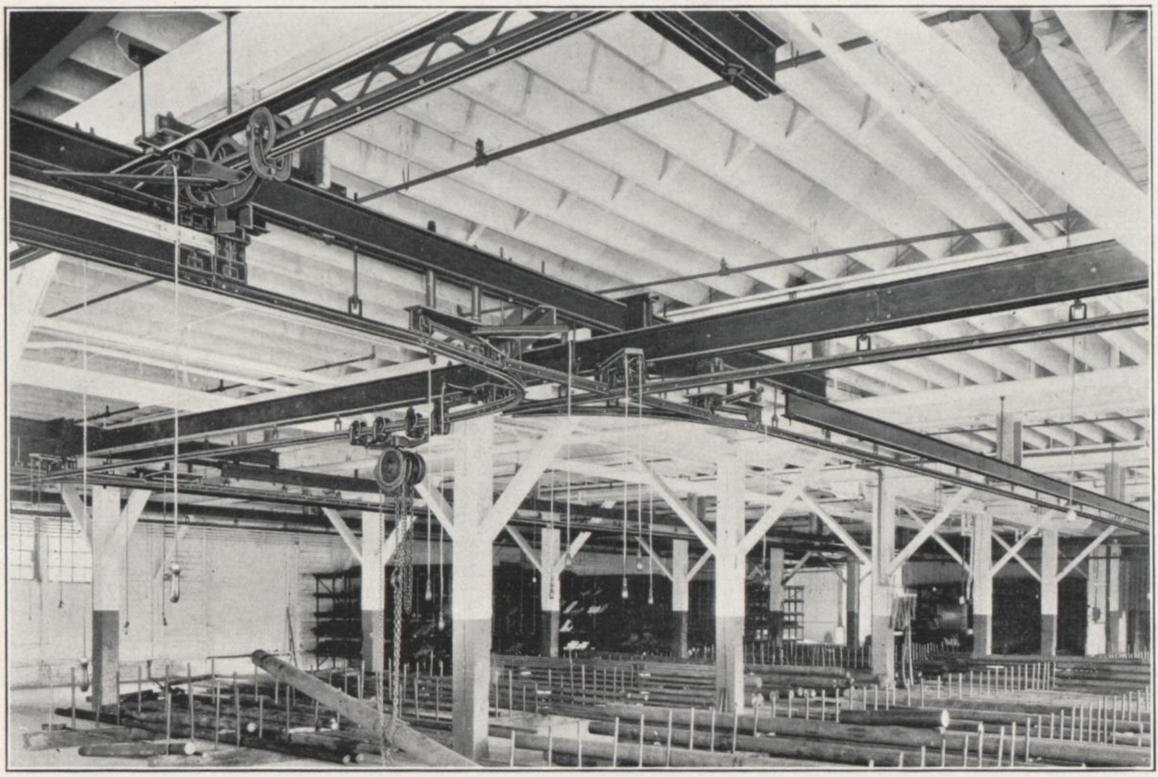


Fig. 17B *MonoRail installation in the steel warehouse of Super Steels, Inc., Cleveland, Ohio. System includes a two-ton crane. Maximum loads are handled. Truss rail provides crane runway.*

Typical MonoRail Curves

The three curves in the group on the left are standard curves used in making right angle turns in MonoRail track and in connection with Tongue Type Switches. The three curves below are standard curves used with Glide Type Switches. Complete information is given on pages following.

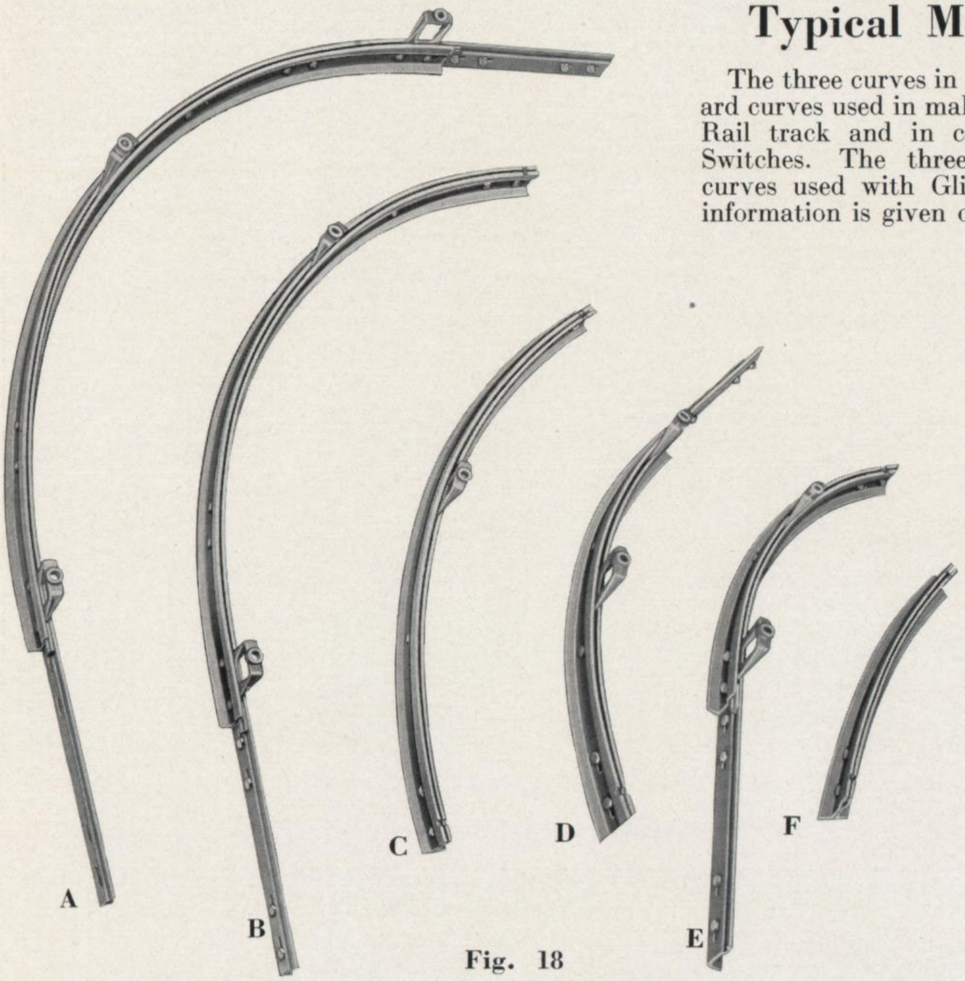


Fig. 18

Standard Series

A - No. 1 Right or Left
B - No. 2 Right No. 3 Left
No. 4 Right No. 5 Left
C - No. 6 Right No. 7 Left
No. 8 Right or Left

Short Series

A - No. 9 Right or Left
B - No. 10 Right No. 11 Left
No. 12 Right No. 13 Left
C - No. 14 Right No. 15 Left
No. 16 Right or Left

Glide Switch Series

A - No. 17 Right or Left
D - No. 18 Right
E - No. 19 Left
F - No. 20 Right or Left

American MonoRail Standard Curves

A system of standardized curves is offered that provides for every situation where track meets at right angles in a MonoRail System, and which offers these advantages:

—This system of curves greatly increases the flexibility of American MonoRail in complicated overhead layout;

—Standardization makes changes in track arrangement a simple matter;

—Changes cause minimum disturbance in plant;

—Standardization permits us to carry in stock accurately fitted curves for immediate shipment;

—It also permits us to fabricate and furnish additional track, curves, and other equipment ready to install from data on original installation in our files.

Curves are assembled for shipment with hangers in place. Hangers, however, are not priced with curves, but should be included in the general order for MonoRail hangers.

On the following pages are diagrams which give the key to the whole MonoRail system of curves. It will be noted that curves have been divided into three series, making the proper selection easy.

STANDARD SERIES

Curves in the standard series are built so that it is five feet from the intersection of tangent lines to the center line of lap splice, or to the hinge of switches, in every combination of switches and curves. See page 19.

SHORT SERIES

The curves of this series are of shorter radius than the standard series and are used where four feet is the measurement from intersection of tangent lines, to center of lap splice, or hinge of switch. See page 20.

GLIDE SWITCH SERIES

Where curves are used with glide type switches, the radius of these curves is uniformly three feet, but reference to the diagram on page 21 will show that four feet is the measurement from the intersection, to center line of the lap splice, while from intersection to switch break in rail, is only three feet.

Group 5

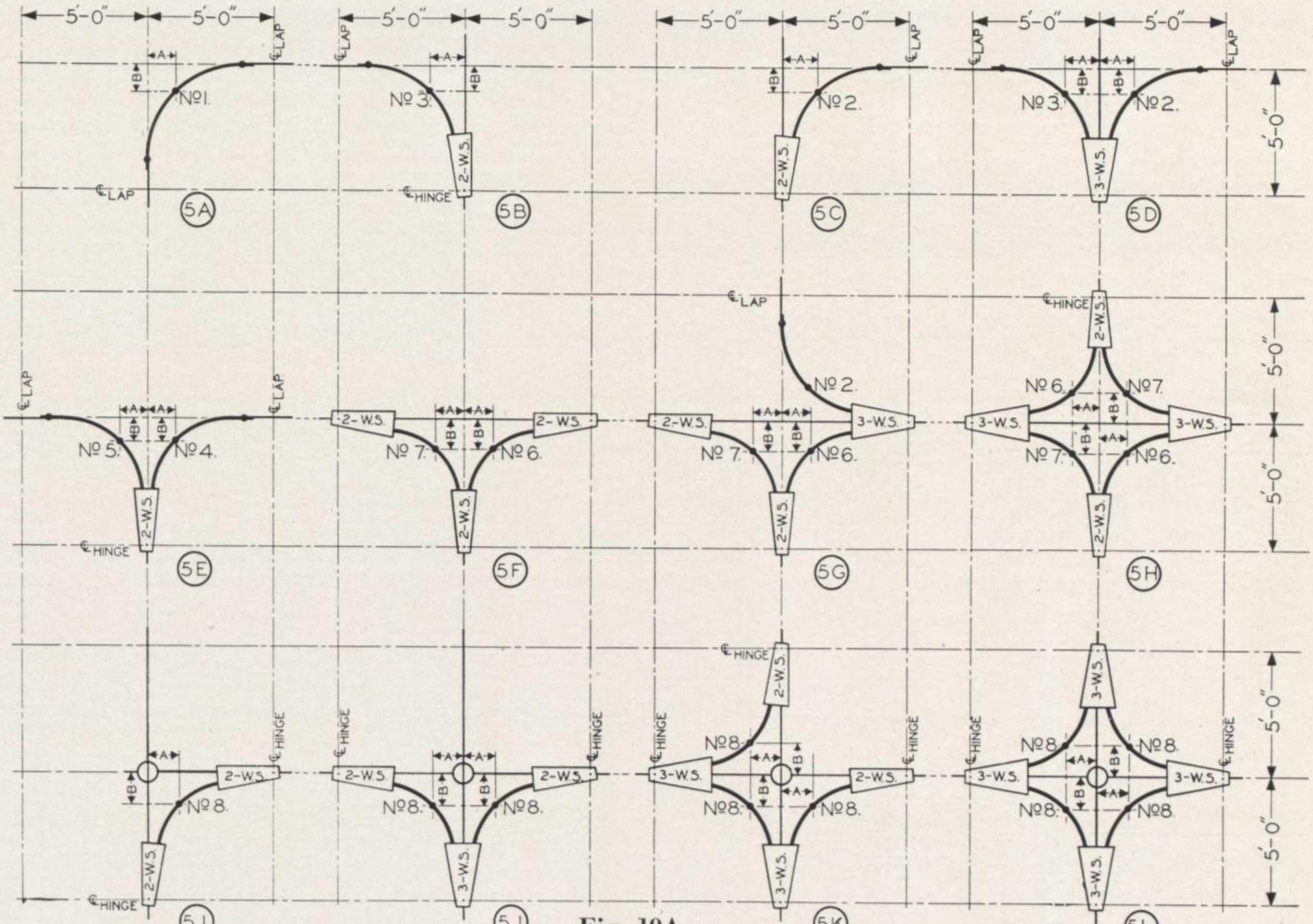


Fig. 19A

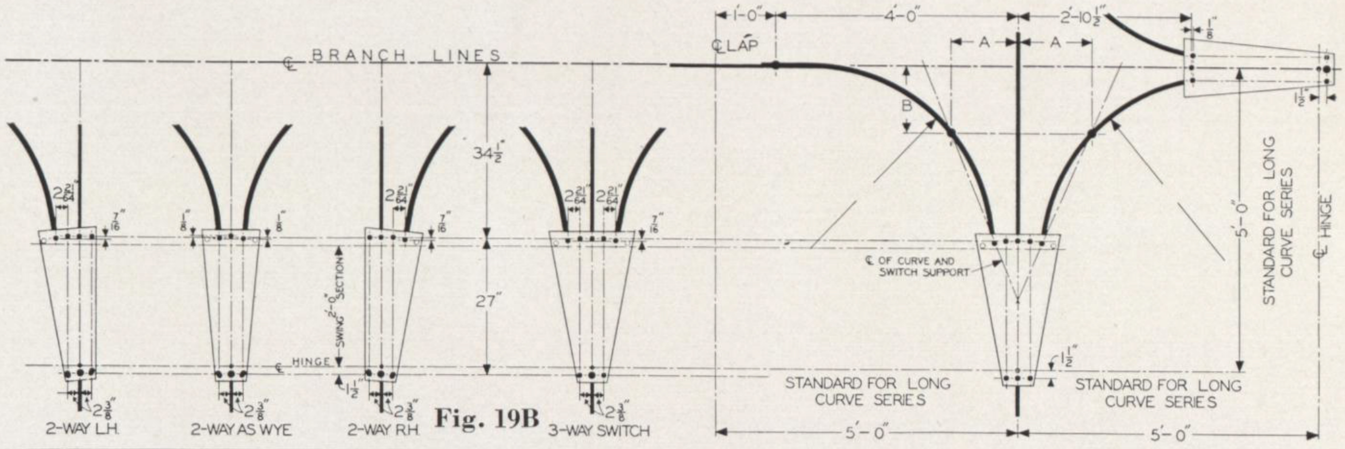


Fig. 19B

SWITCHES REQUIRED					STANDARD CURVES									
Group	2 Way	3 Way	Cross Over	No. Req.	Cv. No.	Radius	No. Req.	Cv. No.	Radius	No. Req.	Cv. No.	Radius	A	B
5-A				1	1	3'-9''							1'-1 3/16''	1'- 1 3/16''
5-B	1			1	3	3'- 5 3/16''							1'-4⅛''	1'- 0⅜''
5-C	1			1	2	3'- 5 3/16''							1'-4⅛''	1'- 0⅜''
5-D		1		1	2	3'- 5 3/16''	1	3	3'-5 3/16''				1'-4⅛''	1'- 0⅜''
5-E	1			1	4	3'- 0 9/16''	1	5	3'-0 9/16''				1'-1 1/16''	0'-10 11/16''
5-F	3			1	6	2'- 6¼''	1	7	2'-6¼''				1'-1''	1'-1''
5-G	2	1		1	2	3'- 5 3/16''	1	6	2'-6¼''	1	7	2'-6¼''	1'-1''	1'-1''
5-H	2	2		2	6	2'- 6¼''	2	7	2'-6¼''				1'-1''	1'-1''
5-I	2		1	1	8	2'-11¾''							1'-3''	1'-3''
5-J	2	1	1	2	8	2'-11¾''							1'-3''	1'-3''
5-K	2	2	1	3	8	2'-11¾''							1'-3''	1'-3''
5-L		4	1	4	8	2'-11¾''							1'-3''	1'-3''

Standard curves are bent to fit accurately built templates. Occasionally they become sprung in shipment or may require slight reforming to meet construction variations. This is easily done by the usual methods of rail bending.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Group 4

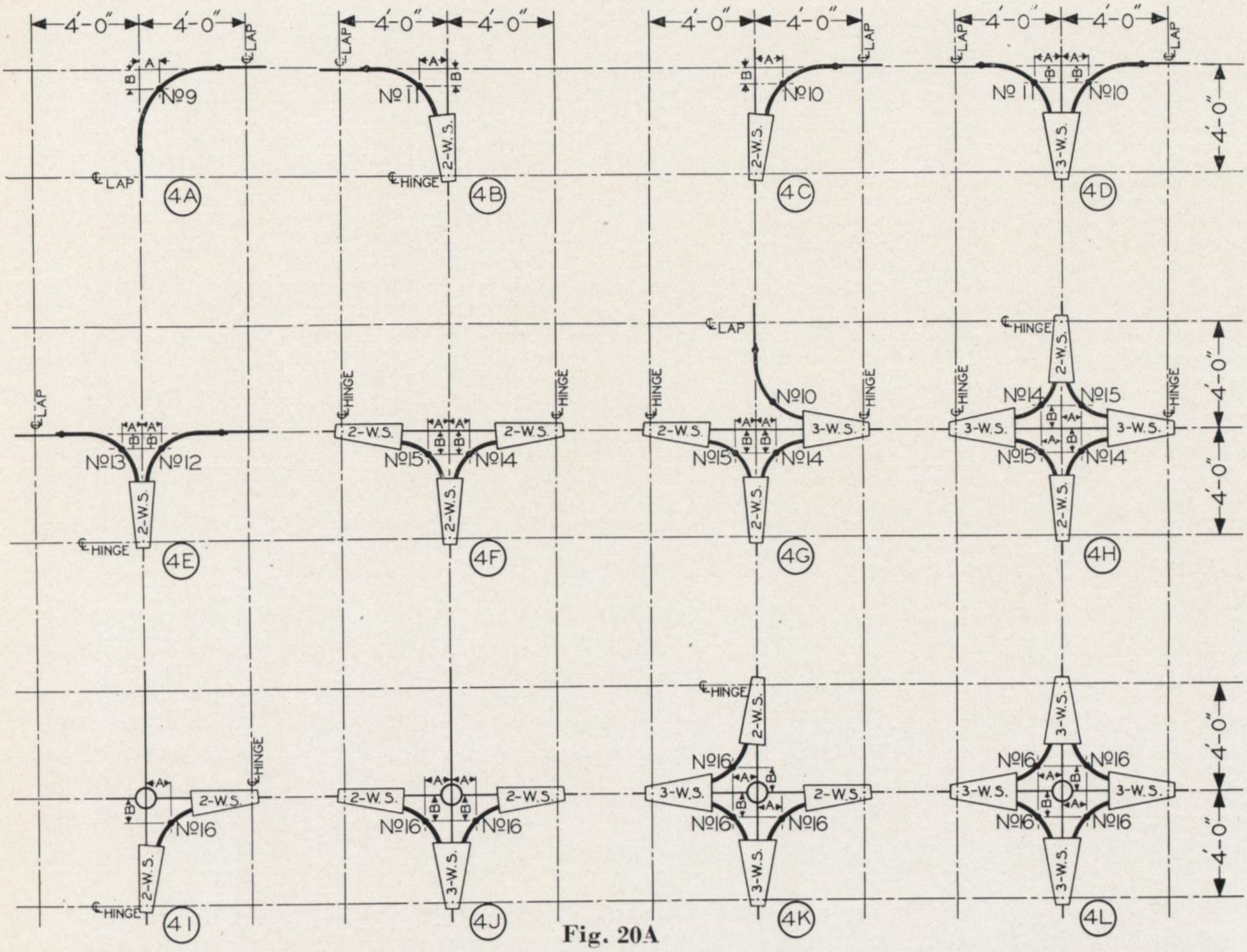


Fig. 20A

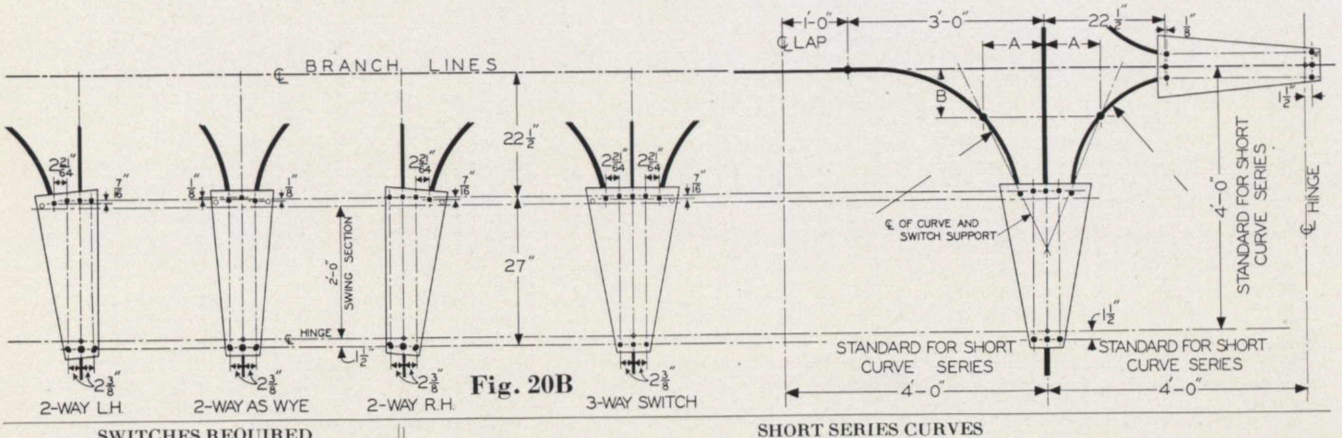


Fig. 20B

SWITCHES REQUIRED					SHORT SERIES CURVES									
Group	2 Way	3 Way	Cross Over	No. Req.	Cv. No.	Radius	No. Req.	Cv. No.	Radius	No. Req.	Cv. No.	Radius	A	B
4-A				1	9	2'-6"							0'-8 25/32"	0'-8 25/32"
4-B	1			1	11	2'-2 7/16"							1'-0"	0'-8 1/8"
4-C	1			1	10	2'-2 7/16"							1'-0"	0'-8 1/8"
4-D		1		1	10	2'-2 7/16"	1	11	2'-2 7/16"				1'-0"	0'-8 1/8"
4-E	1			1	12	1'-11 5/16"	1	13	1'-11 5/16"				0'-9 1/8"	0'-7"
4-F	3			1	14	1'-8 15/16"	1	15	1'-8 15/16"				0'-9 7/8"	0'-9 7/8'
4-G	2	1		1	10	2'-2 7/16"	1	14	1'-8 15/16"	1	15	1'-8 15/16"	0'-9 7/8"	0'-9 7/8"
4-H	2	2		2	14	1'-8 15/16"	2	15	1'-8 15/16"				0'-9 7/8"	0'-9 7/8"
4-I	2		1	1	16	2'-1 1/16"							0'-11 3/8"	0'-11 3/8"
4-J	2	1	1	2	16	2'-1 1/16"							0'-11 3/8"	0'-11 3/8"
4-K	2	2	1	3	16	2'-1 1/16"							0'-11 3/8"	0'-11 3/8"
4-L		4	1	4	16	2'-1 1/16"							0'-11 3/8"	0'-11 3/8"

Standard curves are bent to fit accurately built templates. Occasionally they become sprung in shipment or may require slight reforming to meet construction variations. This is easily done by the usual methods of rail bending.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Group G

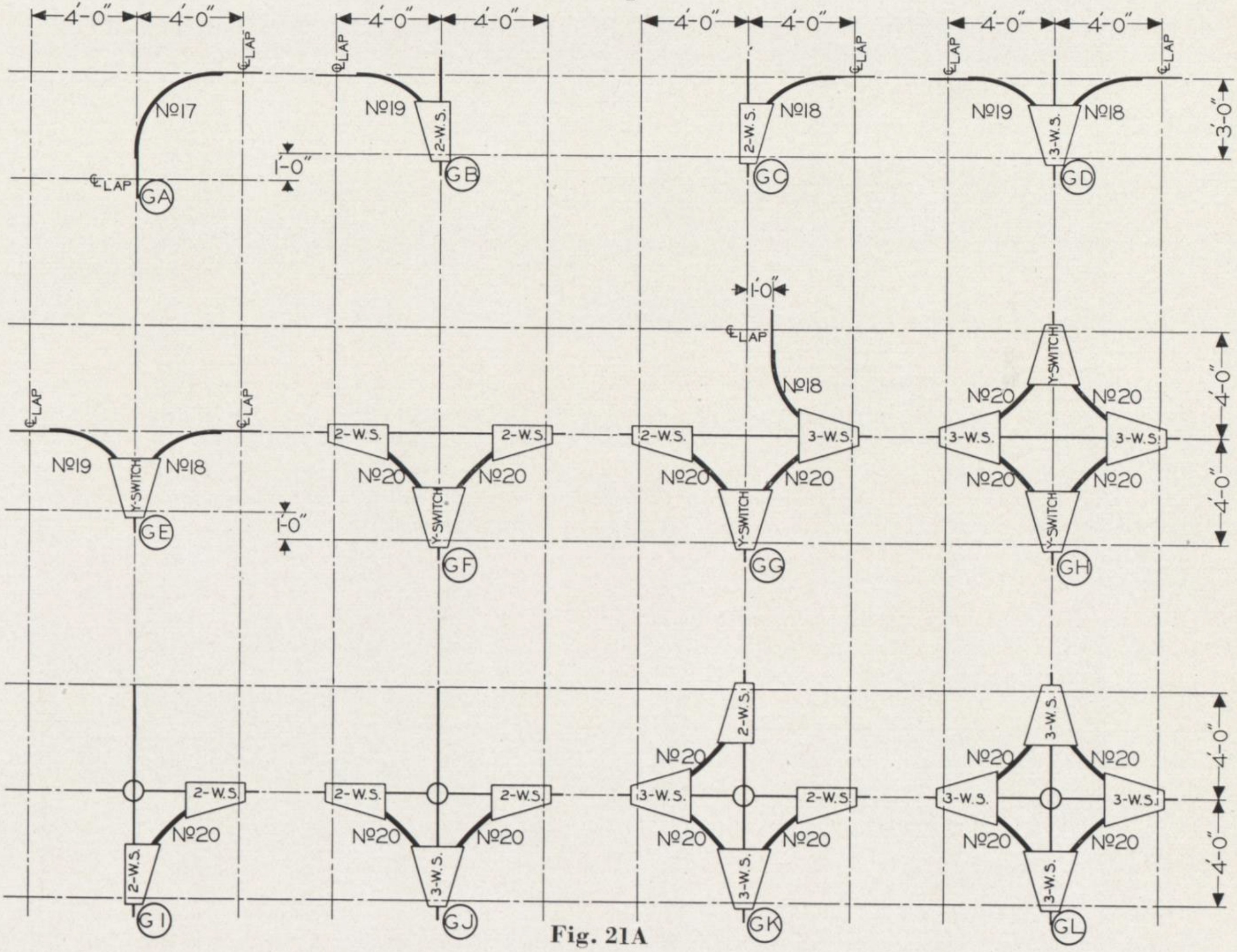


Fig. 21A

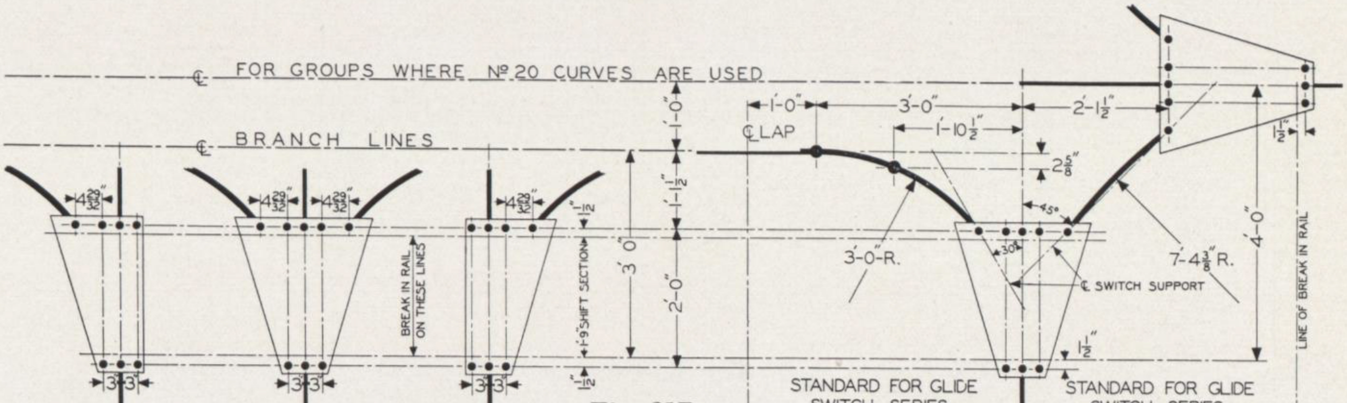


Fig. 21B

SWITCHES REQUIRED						GLIDE SWITCH CURVES								
Group	2 Way	3 Way	Wye	Cross Over	No. Req.	Cv. No.	Radius	No. Req.	Cv. No.	Radius	No. Req.	Cv. No.	Radius	A	B
G-A					1	17	3'-0"								
G-B	1				1	19	3'-0"							0'-10 9/16"	0'-10 9/16"
G-C	1				1	18	3'-0"								
G-D		1			1	18	3'-0"	1	19	3'-0"					
G-E			1		1	18	3'-0"	1	19	3'-0"					
G-F	2		1		2	20	7'-4 3/8"								
G-G	1	1	1		2	20	7'-4 3/8"	1	18	3'-0"					
G-H		2	2		4	20	7'-4 3/8"								
G-I	2			1	1	20	7'-4 3/8"								
G-J	2	1		1	2	20	7'-4 3/8"								
G-K	2	2		1	3	20	7'-4 3/8"								
G-L		4		1	4	20	7'-4 3/8"								

Standard curves are bent to fit accurately built templates. Occasionally they become sprung in shipment or may require slight reforming to meet construction variations. This is easily done by the usual methods of rail bending.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

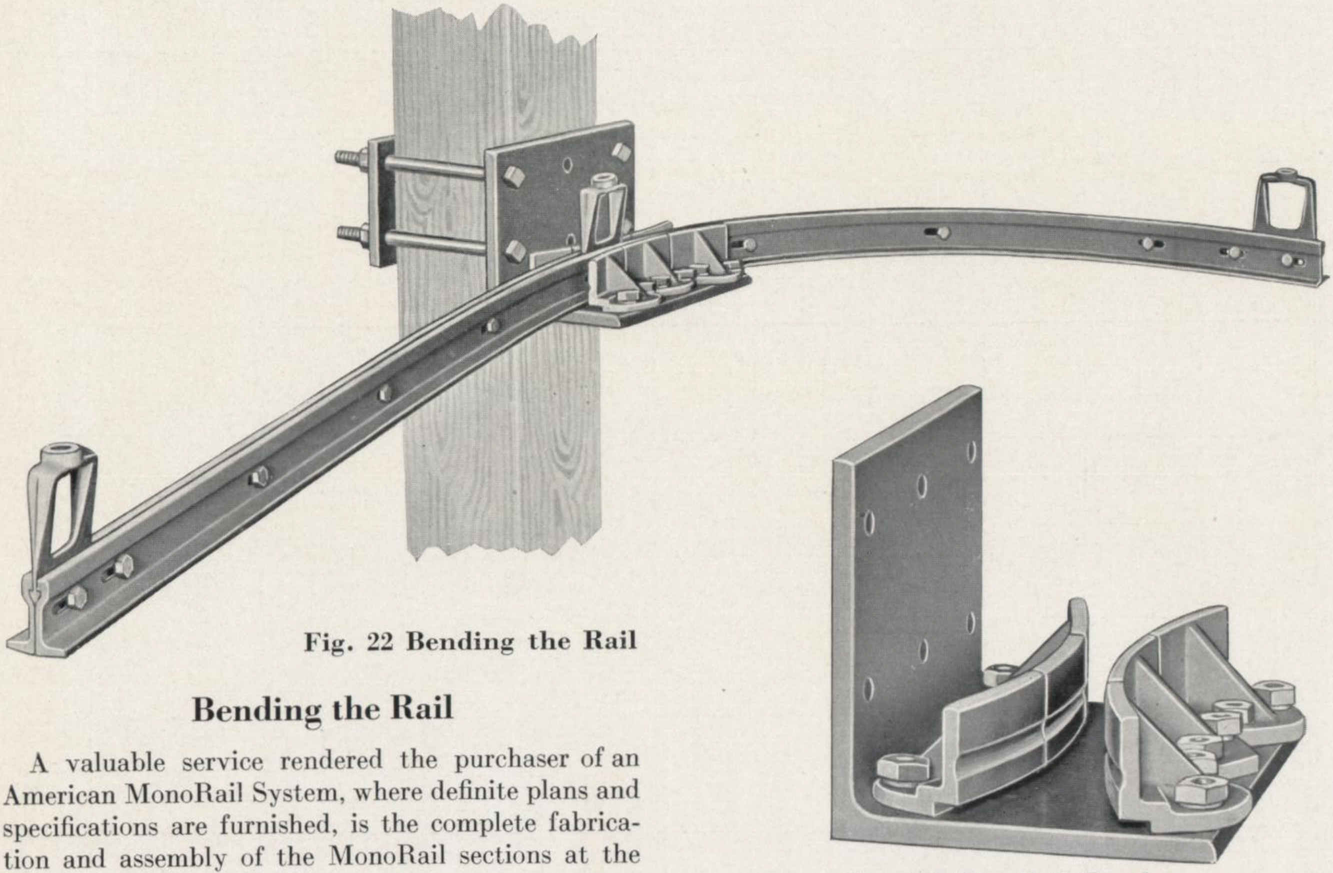


Fig. 22 Bending the Rail

No. 432 The Rail Bender
Weight 32 Pounds

Bending the Rail

A valuable service rendered the purchaser of an American MonoRail System, where definite plans and specifications are furnished, is the complete fabrication and assembly of the MonoRail sections at the factory to fit the job.

If changes in the track plan are likely to occur, it is advisable to have a Rail Bender on the ground in order that the track can be formed in the field to fit into any last minute changes.

American MonoRail can be bent in the field to secure any desired track arrangement involving the use of curves. The Rail Bender, shown in the illustration above, is furnished if desired, subject to return when the installation is complete. It may be bolted to a post, column, or mounted in any convenient manner, and the rail bent to the desired radius.

The rail is of high-carbon content, and is stiff, and harder to bend than mild steel, but with the Rail Bender it can be formed into any curve section.

Where MonoRail is bent in the field, it may be necessary to cut one side of the assembled rail in order to maintain the 18-inch overlap. This should always be done to avoid rough joints.

• • •

This catalog gives full information for making layouts and ordering materials for a complete MonoRail system. When approved plans are furnished, we will fabricate, number each part, and ship ready for erection, with explanatory blueprints carrying identifying numbers. See page 174. Where the handling problem or shop layout is complicated, we suggest a preliminary survey by a MonoRail engineer, at no expense or obligation. On the larger, more complex job MonoRail will make plans, fabricate the system, erect it and deliver it to the customer ready for immediate service.

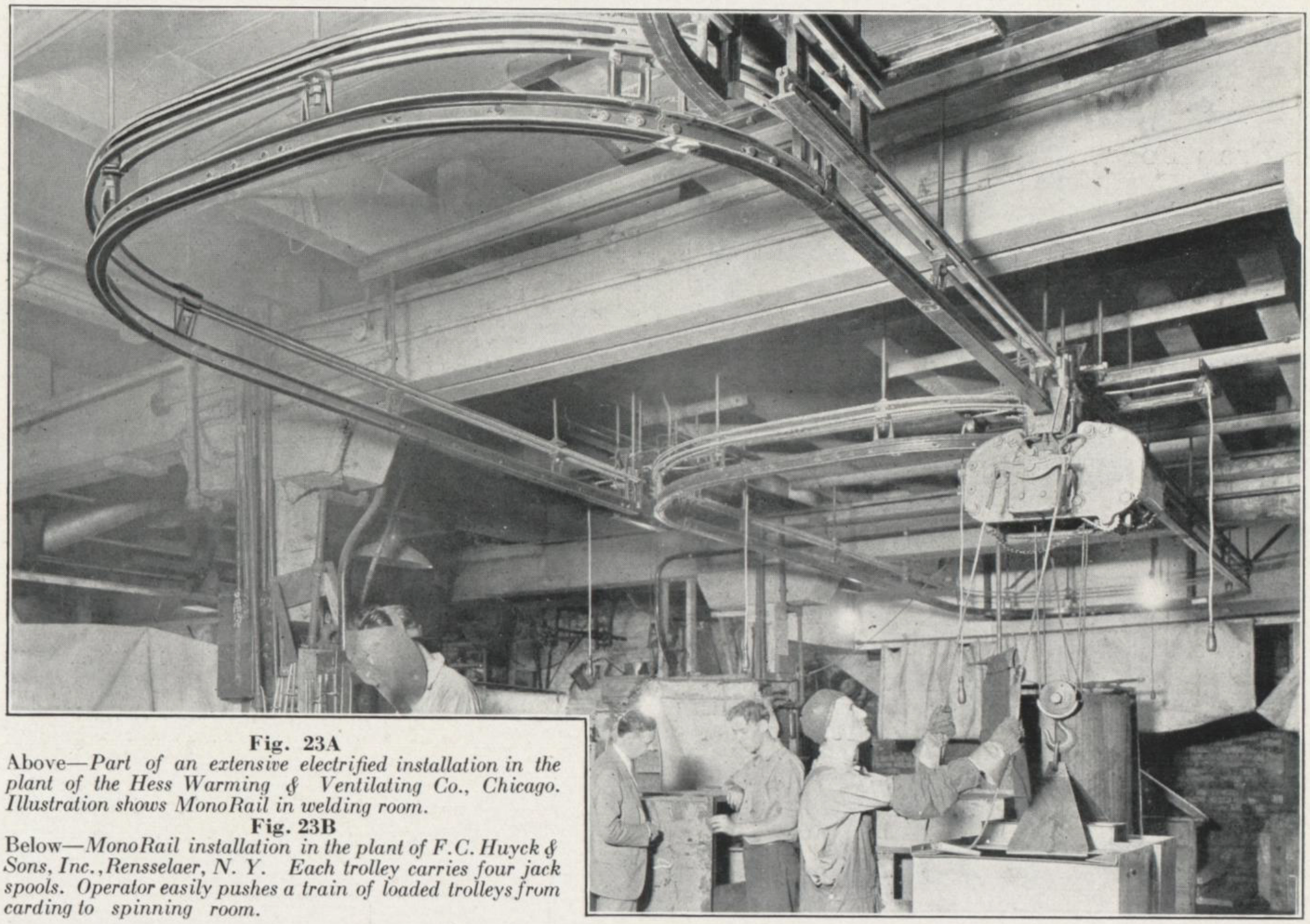
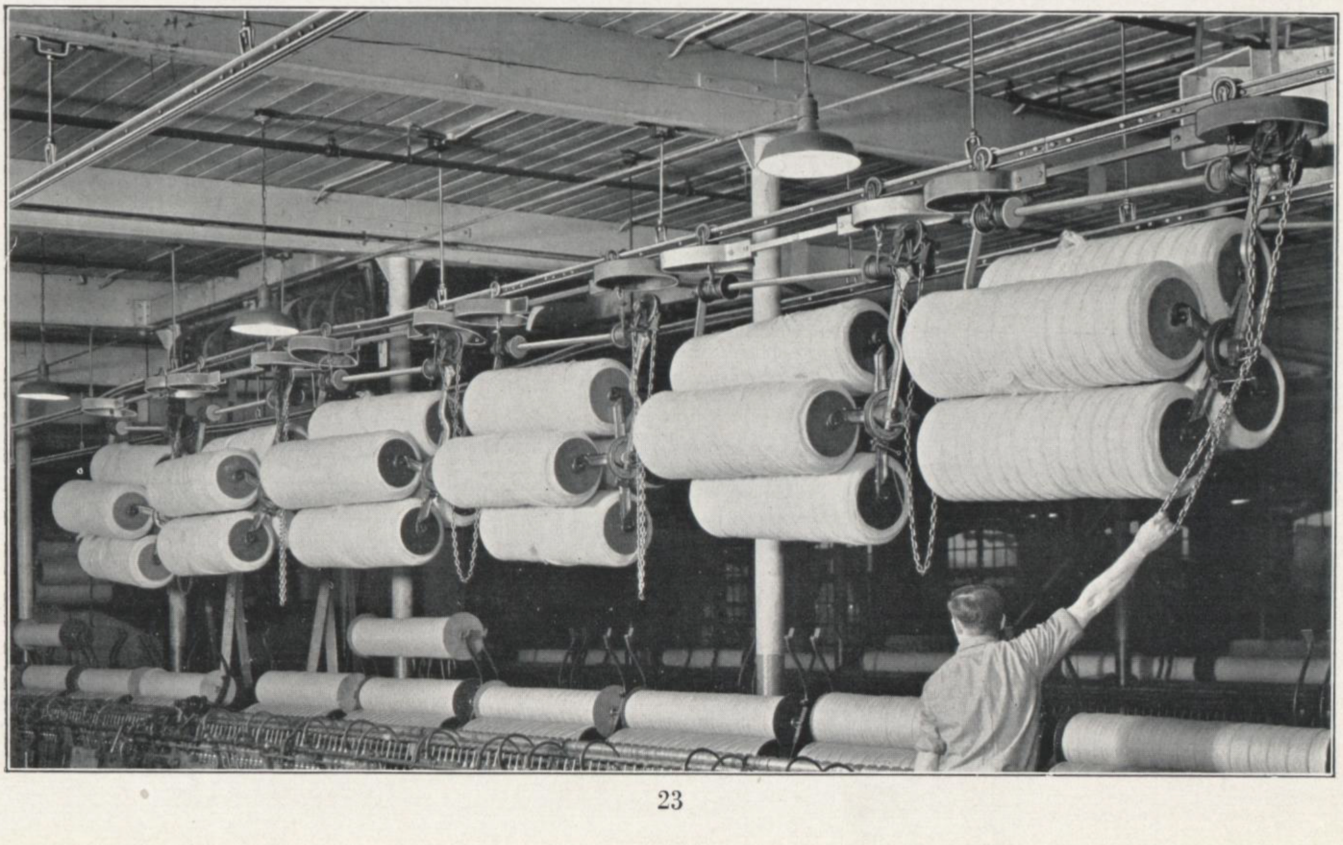


Fig. 23A

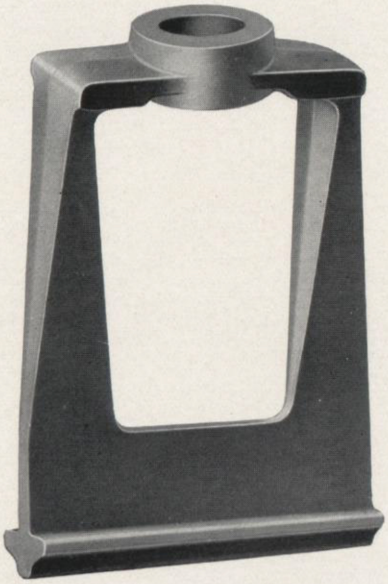
Above—*Part of an extensive electrified installation in the plant of the Hess Warming & Ventilating Co., Chicago. Illustration shows MonoRail in welding room.*

Fig. 23B

Below—*MonoRail installation in the plant of F.C. Huyck & Sons, Inc., Rensselaer, N. Y. Each trolley carries four jack spools. Operator easily pushes a train of loaded trolleys from carding to spinning room.*



No. 407
Drop Forged Hanger



MonoRail Hanger, No. 407, is a one piece drop forging which is shipped assembled in the rail. The hanger is designed to permit direct connection with the various types of beam brackets as well as for adjustable bolt suspension. It is 3¼″ wide by $\frac{3}{16}$″ thick at point of contact with the rail, and has a load bearing strength in excess of seven tons. See pages 28 and 29 for various hookups between MonoRail hanger and superstructure. Weight, one pound.

No. 428 Hanger Suspension Bolts

These bolts are of the machine bolt type. They have extra deep threading which permits vertical adjustment of the rail. They are furnished with one square nut, one jam nut, and one lock washer. One nut is seated inside the hanger, the other drawn down tight on top of the hanger to lock the bolt firmly. Bolts are furnished in lengths up to 36″.

N.B. Be sure to specify length wanted.

No. 493 Hanger Stud Bolt

Where it is necessary to use a stud bolt, or for lengths longer than 36″, special stud bolts are furnished, each with three square nuts, one jam nut, and two lock washers. N. B. Be sure to specify No. 493, giving length wanted.

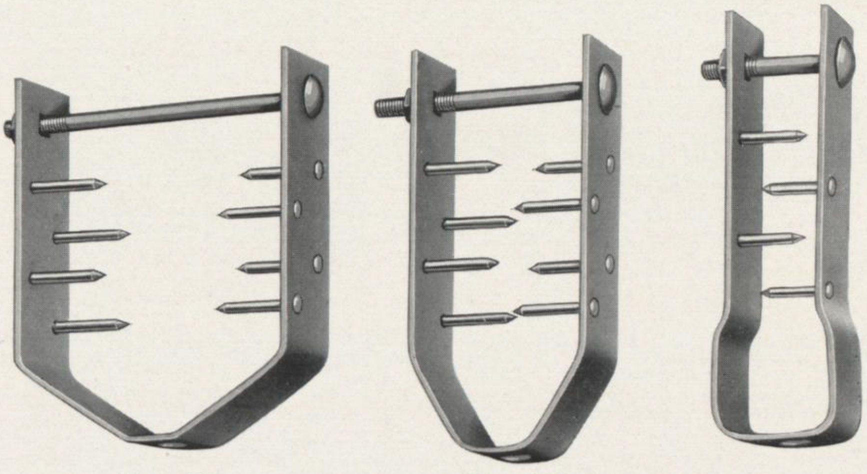
No. 491 Hanger Suspension Bolt for Electrified MonoRail

No. 491, with specially long threading is used in electrified systems. In ordering, specify catalog No. 491.

Table of Hanger Spacing in feet.

	TROLLEY LOADS	CATALOG NUMBER OF TROLLEY	ONE TROLLEY ONLY	TWO TROLLEYS	THREE TROLLEYS	FOUR OR MORE TROLLEYS
AGGREGATE DISTRIBUTED LOAD	250	Closely Placed Wheel Loads Evenly Distributed	*The above hanger spacings are for straight runs. Spacings at curves and switch connections should be as shown on page 173 and as described in the specifications on curves. Hangers should be arranged to come within one foot either way from the center of lap splices.*			10
	500					10
	1000					8
	1500					6
	2000					5
	2500					4
	3000					3½
TWO WHEEL TROLLEYS	250	No. 188	10	8	6	5
	500	No. 150	8	5	4	4
	750	No. 157-179	6	4	3½	3
	1000		5	4	3	3
FOUR WHEEL TROLLEYS	250	No. 189	10	8	7	6
	500		8	5	4½	4
	500	No. 165-162	8	6	4½	5
	750		7	5	4	4
	1000		6	4	4	4
	1250	No. 162	4½	3½	3½	3½
	1500		4	3½	3½	3½
	1000	No. 180	6	4	3½	3½
	1500		4½	3½	3½	3½
	2000		4	3½	3	3
EIGHT WHEEL TROLLEYS	1000	No. 175-171	7	5	5	5
	1500		6	5	5	5
	2000		5	4	4	4
	2500	No. 171	4	4	4	4
	3000		3½	3½	3½	3½
	2000		5	4	4	4
	2500		4½	4	4	4
	3000	No. 181	4	3½	3½	3½
	3500		3½	3	3	3
	4000		3	3	3	3

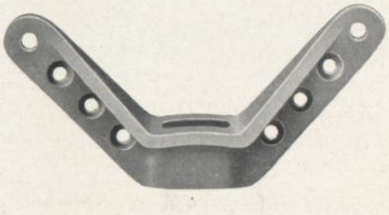
MonoRail Wood Beam Brackets


No. 487 No. 404 No. 488

This bracket is used for supporting MonoRail track where wood beams form the superstructure. It is formed for attachment to 2″, 4″ or 6″ beam. This bracket is stamped from a steel bar to size ⅛″ x 2″ x 5¼″. It is attached to the beam by a ⅜″ bolt, supplemented by special barbed boat nails. The bolts and nails are furnished with the bracket. Two methods of combination with MonoRail Hanger, No. 407, are shown in Figs. 28A and 28B on page 28.

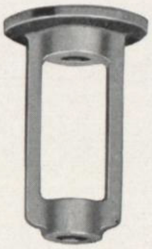
No. 488, 2-inch bracket weighs 1 pound.
No. 404, 4-inch bracket weighs 1 pound.
No. 487, 6-inch bracket weighs 1 pound 4 ounces.

No. 419 Side Beam Bracket



For those cases where the regular beam bracket No. 404 cannot be used, this bracket is mounted on the side of the beams. It is used for bolt suspension only. Two bolts are furnished for attaching the bracket to the beam, where size of beam is known, supplemented by special barbed boat nails. The material is high-grade malleable iron. Weight 1½ pounds.

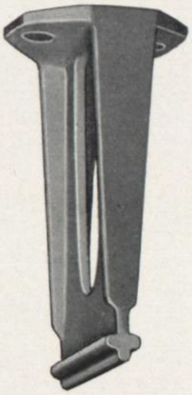
No. 472 Ceiling Buckle



The MonoRail Ceiling Buckle forms a proper means of support for the rail where expansion shields or cinch anchors are used in concrete ceilings. The flange at the top insures rigid attachment to the ceiling, while permitting flexibility in the suspension. Material, high grade malleable iron. Weight, 1½ lbs. Application shown in figure 29D, page 29.

Dimensioned diagrams showing the application of the Ceiling Buckle and other Track Suspension items are shown on pages 168 and 169.

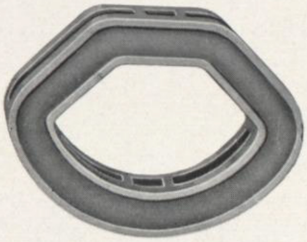
No. 405 Rigid Hanger



This hanger furnishes a means of rigid suspension for track running under wood or metal superstructure. It may be attached to wood or metal beams. Bolt holes are spaced on 1¾″ centers, using a half-inch bolt. Weight, 1¼ pounds.

No. 470, Rigid MonoRail Hanger, of the same type is used where a wider spacing of mounting bolts is necessary. Bolt holes are spaced on 2½″ centers, for ⅝″ bolt. Weight of No. 470, 1 pound, 15 ounces.

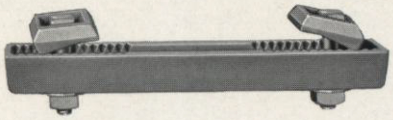
No. 455 Suspension Buckle



The MonoRail suspension buckle provides suspension by means of diagonal suspension rods for track running parallel to, and not under, supporting members. It also furnishes additional support for track running at an angle to overhead beams by putting in rods running to suspension buckle midway of beams. It finds frequent use for bracing to prevent sway in track. It is made of high-grade malleable. Weight 2½ pounds. Its application is illustrated in figure 297, page 29. Also see diagrams on pages 168 and 169.

No. 479-Beam Clamp for 5½″ Flange

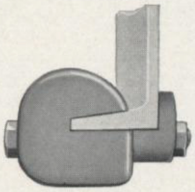
No. 480-Beam Clamp for 8½″ Flange



I-beam clamp No. 479, made up of Drop Forged parts and bolts combines strength with flexibility of application, and supplies a reliable load carrying member. Its flexibility is gained by the slotted holes through the beam member, the upper edges of which are notched to engage lugs on the clips. This permits placing the hanger bolt at any place along the length of the beam or the clamp may be used to carry the hanger in an offset position. Used for flange widths up to 5½″. Weight, 4½ pounds.

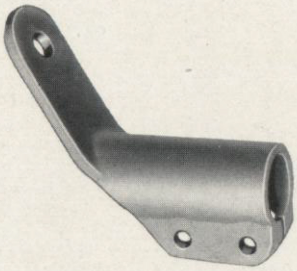
I-beam clamp No. 480 is the same as No. 479 except that it is used for flange widths up to 8½″ and weighs 5¾ pounds.

No. 456 Channel Clamp



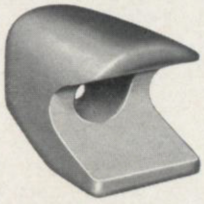
A clamp designed for the suspension of MonoRail from 4″ to 10″ light channels where flange width is not over 2⅝″ and thickness is not in excess of $\frac{5}{16}$″. In combination with Flange Clamp No. 485 it is also used as track suspension from I-Beams, channels, or structural members made up of channels or angles set back to back. Material, high-grade malleable. Weight, 13 ounces. Illustration of this clamp in use will be found on page 29, Fig. 29A.

No. 484 Pipe Clamp Brace Fitting



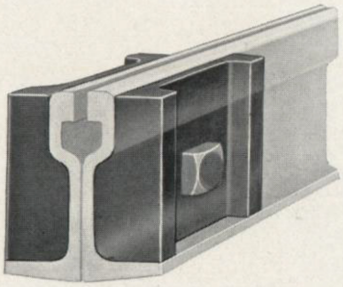
This adjustable brace clamp permits the quick, easy and effective bracing of MonoRail track or superstructure without the necessity of making accurate measurements and laying out bracing for fabrication in the shop. All that is necessary is to determine the proper position of the clamps, then, to cut the pipe to the proper length with a hacksaw. The fitting clamps the end of the pipe firmly and is adjustable for length, making close measurement unnecessary. The bolt flange may be bent to fit the required angle as the clamp is made of high-grade malleable. See illustrations on page 169. Clamping bolts are furnished and bolt flange is drilled with $\frac{11}{16}$″ hole for mounting bolt. Weight, 1¾ pounds.

No. 485 Flange Clamp



This flange clamp, a rugged malleable casting, is used with channel clamp No. 456 to furnish suspension for MonoRail track under I-beams, superstructure members made up of channels or angles placed back to back, and is used in pairs as anchorage for tie-rods between I-beams channels, Girder Rail, etc., as shown in Fig. 29A, page 29. Weight, 1½ pounds.

No. 414 End Stop



The end stop bolts to the rail at the end of runway to prevent trolleys running off the track. The stop is made of malleable iron in two parts that bolt to the track through the clamping bolt holes. Weight one pound.

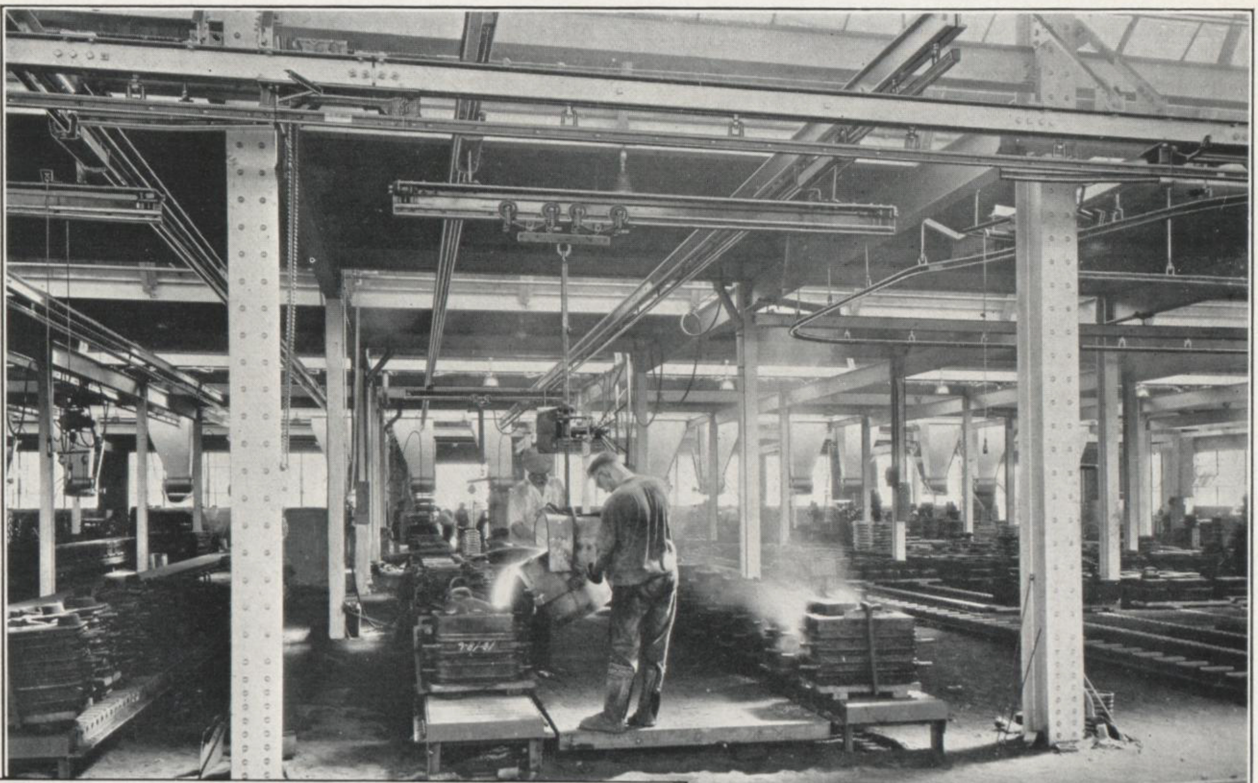
No. 429 Bracket Nail

Bracket nails are furnished with all wood beam brackets. They are of special design, heavy and strong, with barbed chisel point, and hold firmly in wood beams. Size, ¼″ diameter, 3″ long. Weight, 22 nails to the pound.

No. 453 Ceiling Cleat

The ceiling cleat, bolted to any horizontal surface such as wood beams, concrete ceiling, or laminated floors, furnishes simple and economical suspension for MonoRail track, using hanger bolt No. 428 of proper length to secure desired track level. This cleat is pressed from steel bar, the weight, 1½ pounds. It is shown in combination with other units on page 29, figure 29B.

NOTE: Applications of MonoRail Track Suspension units are illustrated in combinations on pages 28 and 29, also by dimensioned diagrams on pages 168 and 169.



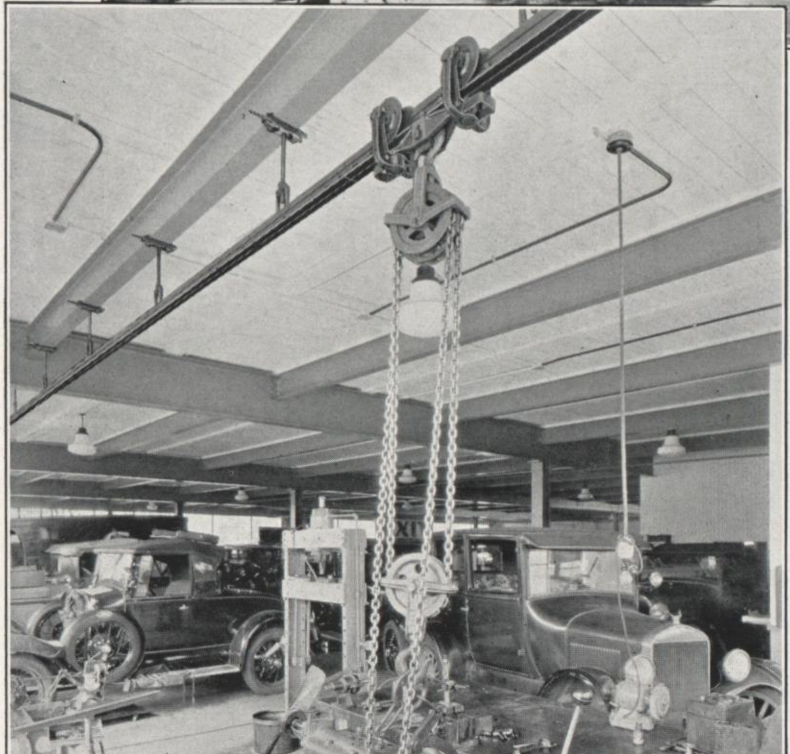


Fig. 27A

Above—*Lebanon Steel Foundry, Lebanon, Pa. Pouring molds from ladle carried on MonoRail crane. Crane interlocks with spur track served by switch shown at upper right.*

American MonoRail Tailor-Made Track Plans have won the enthusiastic endorsement of executives and engineers.

Fig. 27B

Left—*American MonoRail installation in the service station of the Searles Motor Company, Cleveland, Ohio.*

This MonoRail Overhead System is used to handle motors from cars to running-in stands and work benches.

American MonoRail Track Suspension

No overhead material handling system can be stronger than the units which support the track.

Beside strength, the factors of headroom saving, and ease and low cost of installation have been kept constantly in mind in developing the various types of suspension equipment for American MonoRail.

Every unit has been figured with a surplus of strength for a liberal margin of safety. Advantage has been taken of every opportunity to save headroom. The hookup between the rail runway and the overhead beam or ceiling where headroom is at a premium is as close as can be and still allow trolley wheel clearance.

Where wood beams make up the superstructure, bolts and nails are furnished for attaching the wood beam brackets. Clamping bolts are furnished with I-beam brackets.

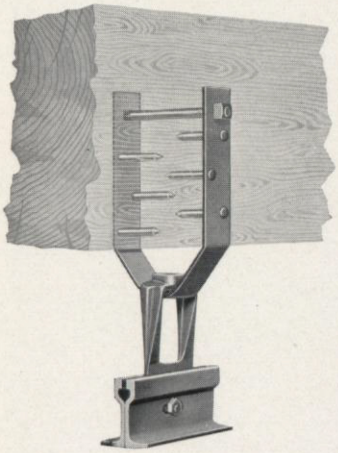


Fig. 28A

MonoRail suspended under wood beam with direct connection between rail hanger and beam bracket.

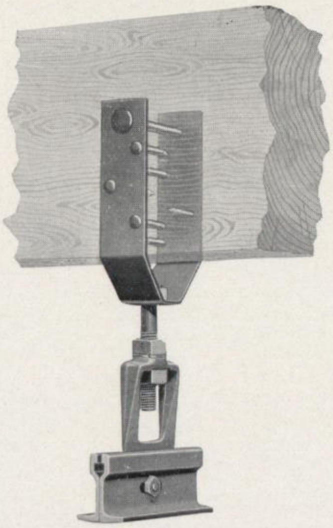


Fig. 28B

MonoRail suspended under wood beam with adjustable bolt suspension between rail hanger and beam bracket.

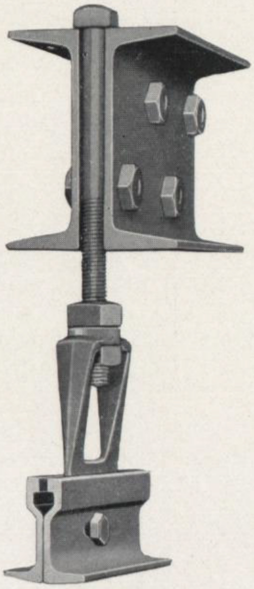


Fig. 28C

MonoRail suspended under double channel superstructure. Adjustable bolt suspension with MonoRail hanger.

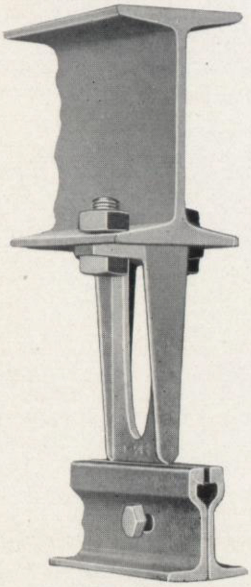


Fig. 28D

MonoRail suspended by rigid hanger, No. 405, bolted to lower flange of I-beam superstructure.

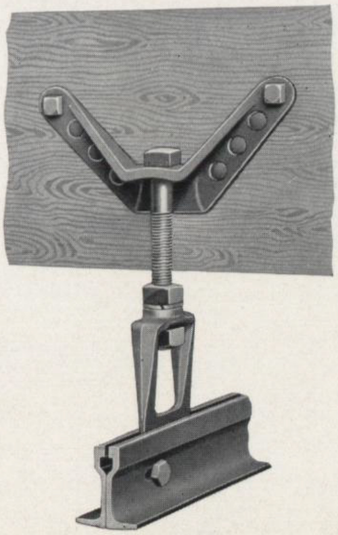


Fig. 28E

MonoRail suspended from wood beam using side beam bracket, No. 419. Bolt suspension must always be used with this bracket.

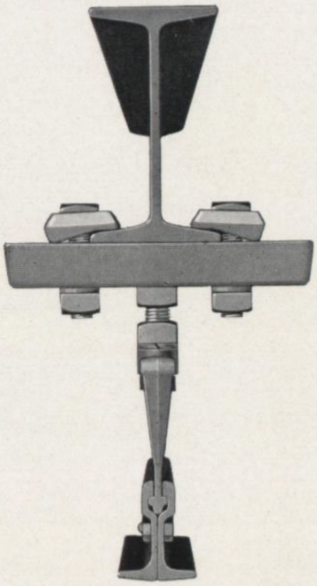


Fig. 28F

MonoRail suspended from I-beam clamp, No. 479, with adjustable bolt suspension to rail hanger.

American MonoRail Track Suspension

The factors of low cost and ease of installation will be easily recognized from the fact that in many cases the work may be done by shop gangs under supervision of master mechanic or millwright, or by local labor. Where layout with all dimensions and clearances are given as described on page 165, only such corrections as are necessary to fit building variations need be made in erecting the system. Where erection is handled by customer, blueprints are furnished on which all parts are plainly numbered to indicate the location of the various units.

On these pages are illustrated American MonoRail suspension units with examples showing their application under varying conditions of superstructure.

Note: Approximately one half of American MonoRail is installed without the use of additional superstructure.

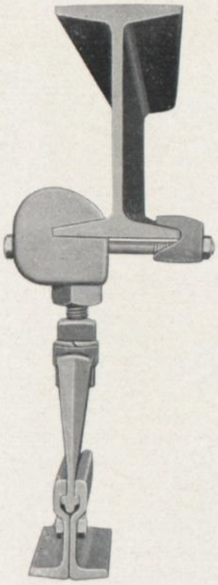


Fig. 29A

Offset suspension by combination of channel clamp No. 456 and flange clamp No. 485.

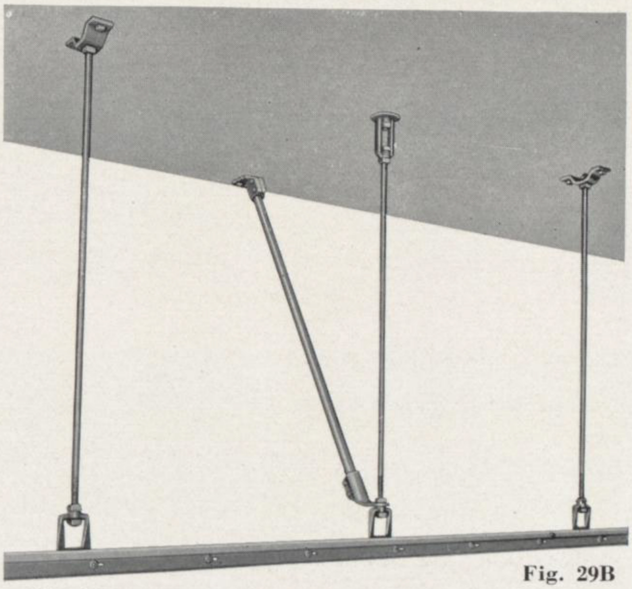


Fig. 29B

Fig. 29B **Fig. 29C** **Fig. 29D**

Fig. 29B. MonoRail suspension using ceiling cleat, No. 453 with adjustable bolt suspension and MonoRail hanger. Fig. 29C. Pipe clamp Brace Fitting No. 484 used to brace track. Attached to ceiling, and to track at hanger. Fig. 29D. MonoRail suspension using ceiling buckle, No. 472, with adjustable suspension using stud between ceiling buckle and MonoRail hanger.

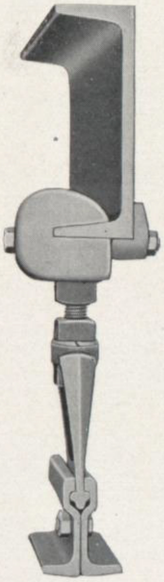


Fig. 29E

Flange clamp, No. 485, with cleat providing adjustable bolt suspension for MonoRail track.

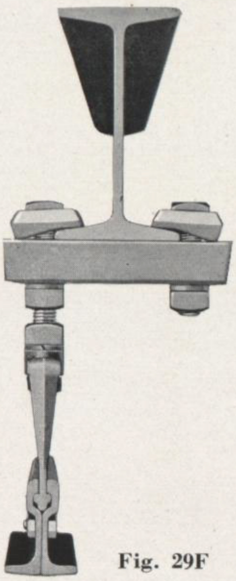


Fig. 29F

Offset suspension for MonoRail track, providing adjustable bolt suspension.

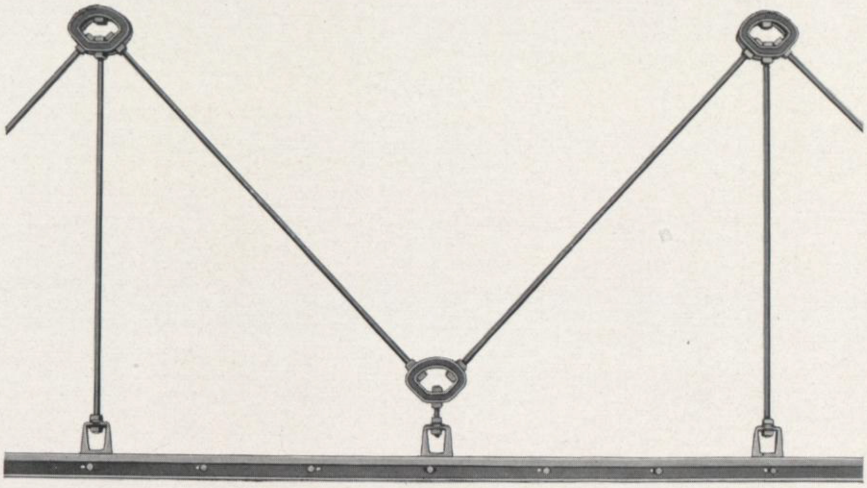


Fig. 29G

MonoRail suspension using suspension buckle, No. 455, with rod for trussing long spans or bracing against sway.

See diagrams on pages 168, 169.

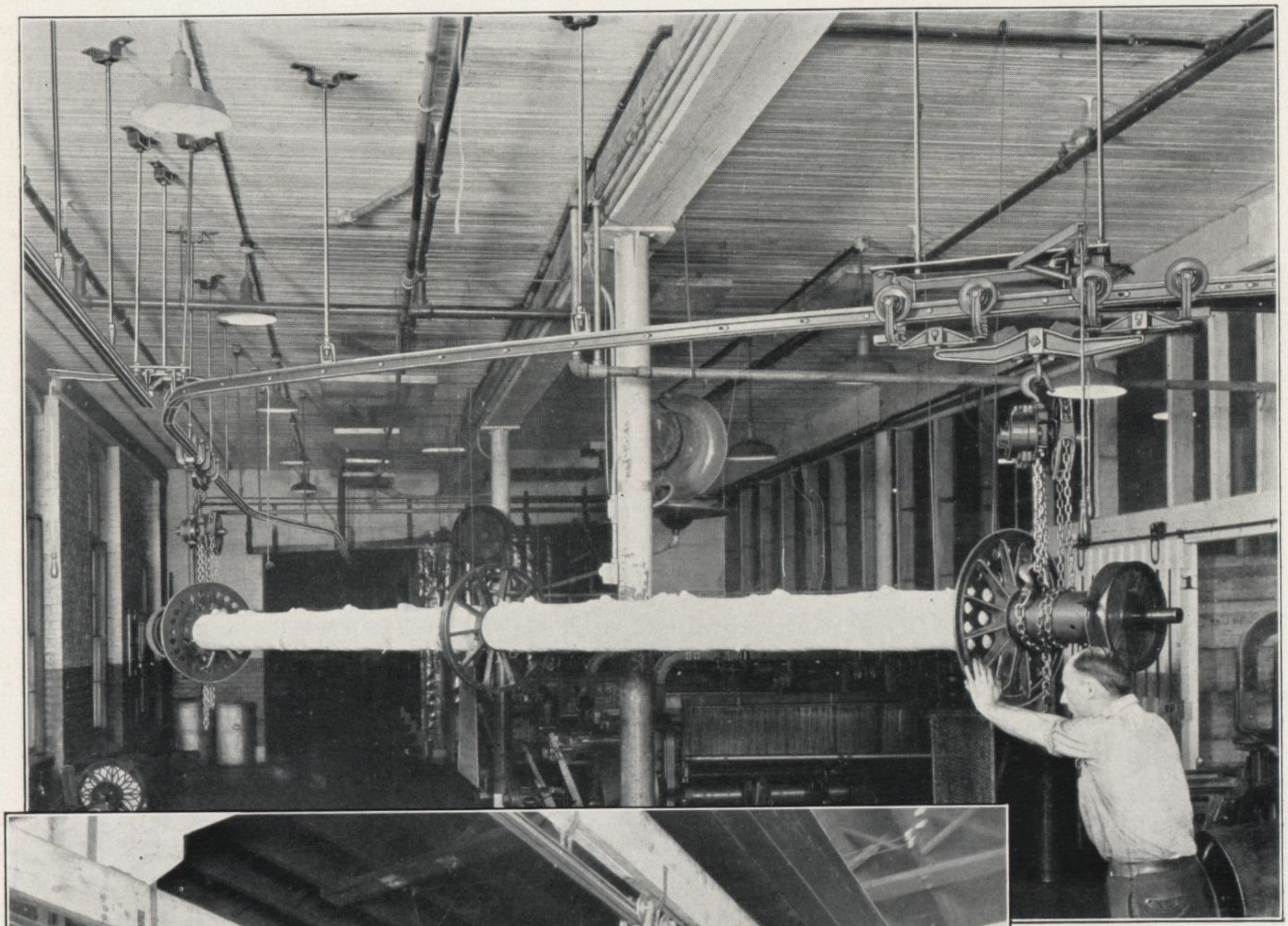


Fig. 30A

Above—*A warp beam, 22 feet long, supported at each end by an eight-wheel trolley, No. 171, carried on a MonoRail system in the plant of F. C. Huyck and Sons, Inc., Rensselaer, N. Y. Loads of 3400 lbs. are carried on these trolleys. Suspension is by ceiling cleats.*

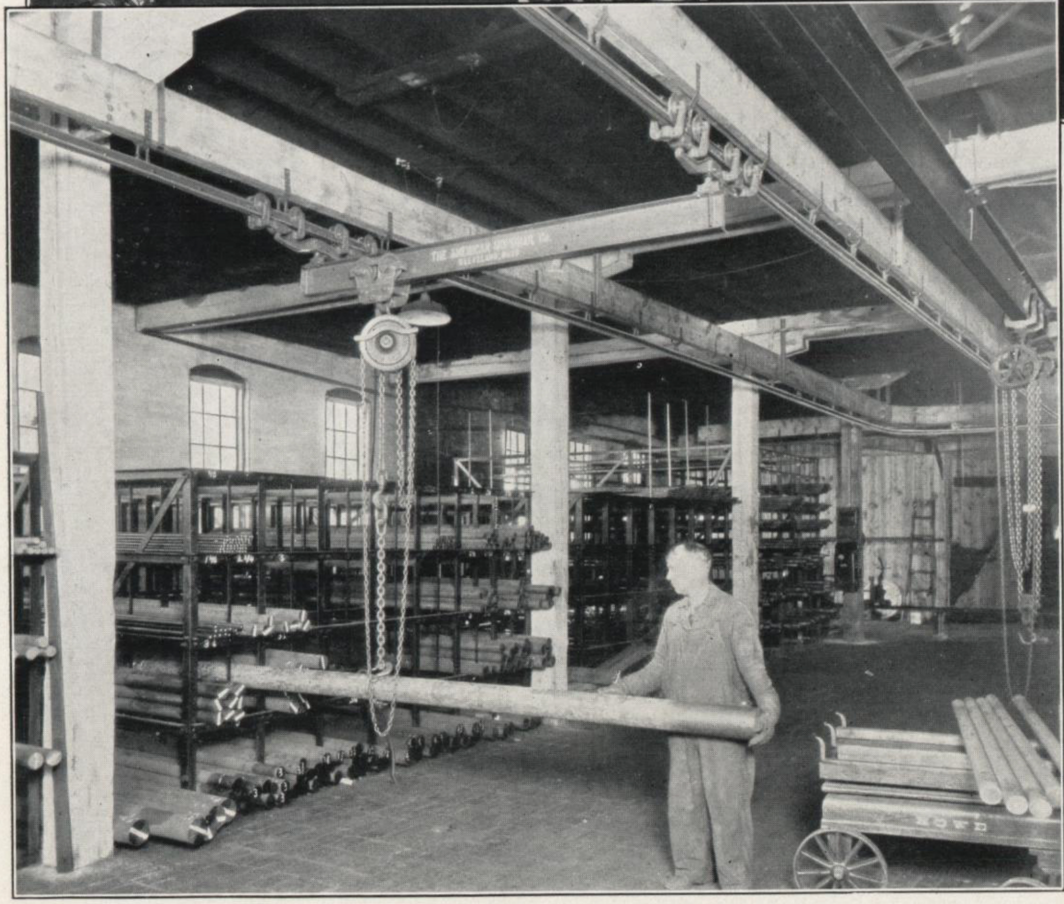


Fig. 30B

Left—*An example of MonoRail suspension from wood beams using beam bracket, No. 404. Equipment shown is a combination bridge crane and straight-away carrier used in handling steel to and from storage racks in the plant of Super Steels, Inc., Cleveland.*

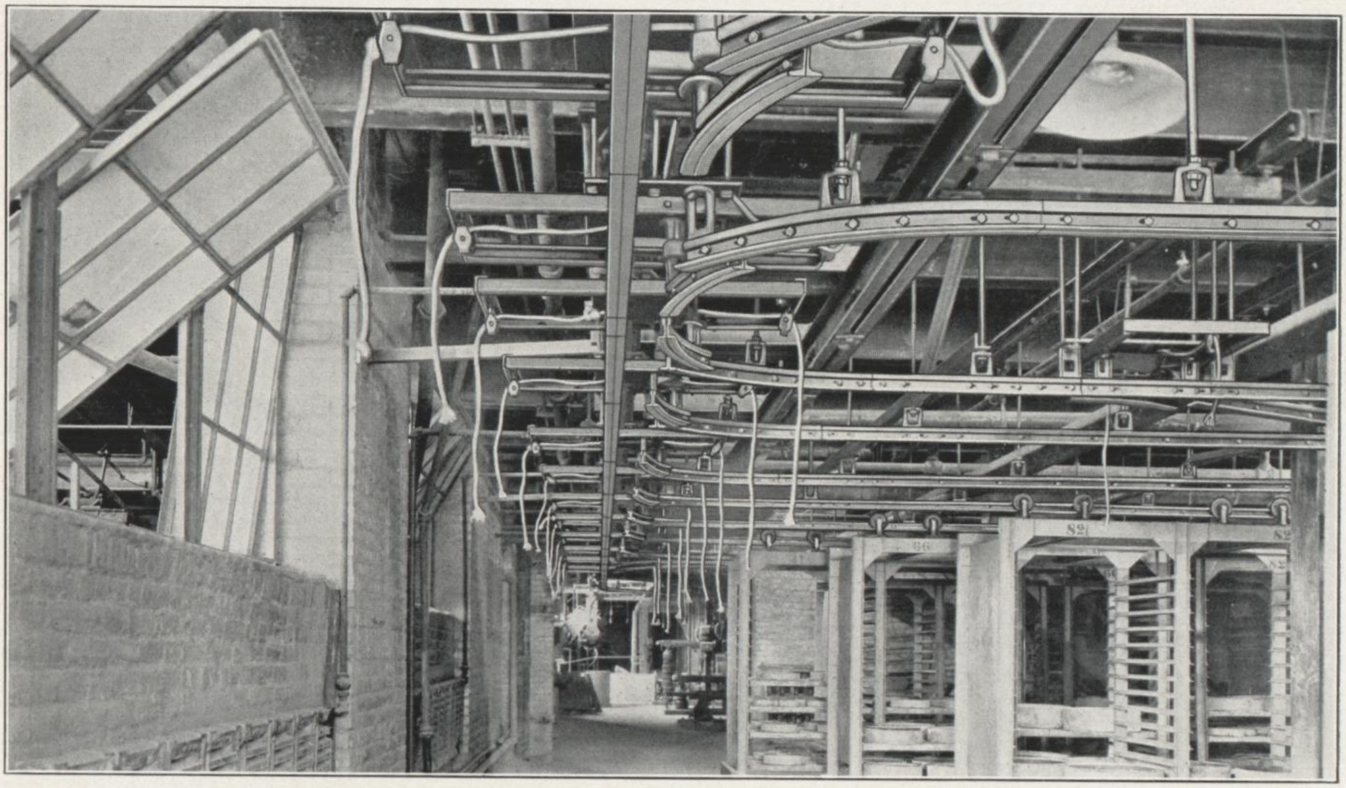


Fig. 31A *MonoRail curves and glide type switches in the plant of the Abrasive Company, Philadelphia. Note the compactness of the system. Smooth trackage of MonoRail is essential to prevent precipitation in solution in molds in racks. System is of 4000 pounds capacity throughout.*

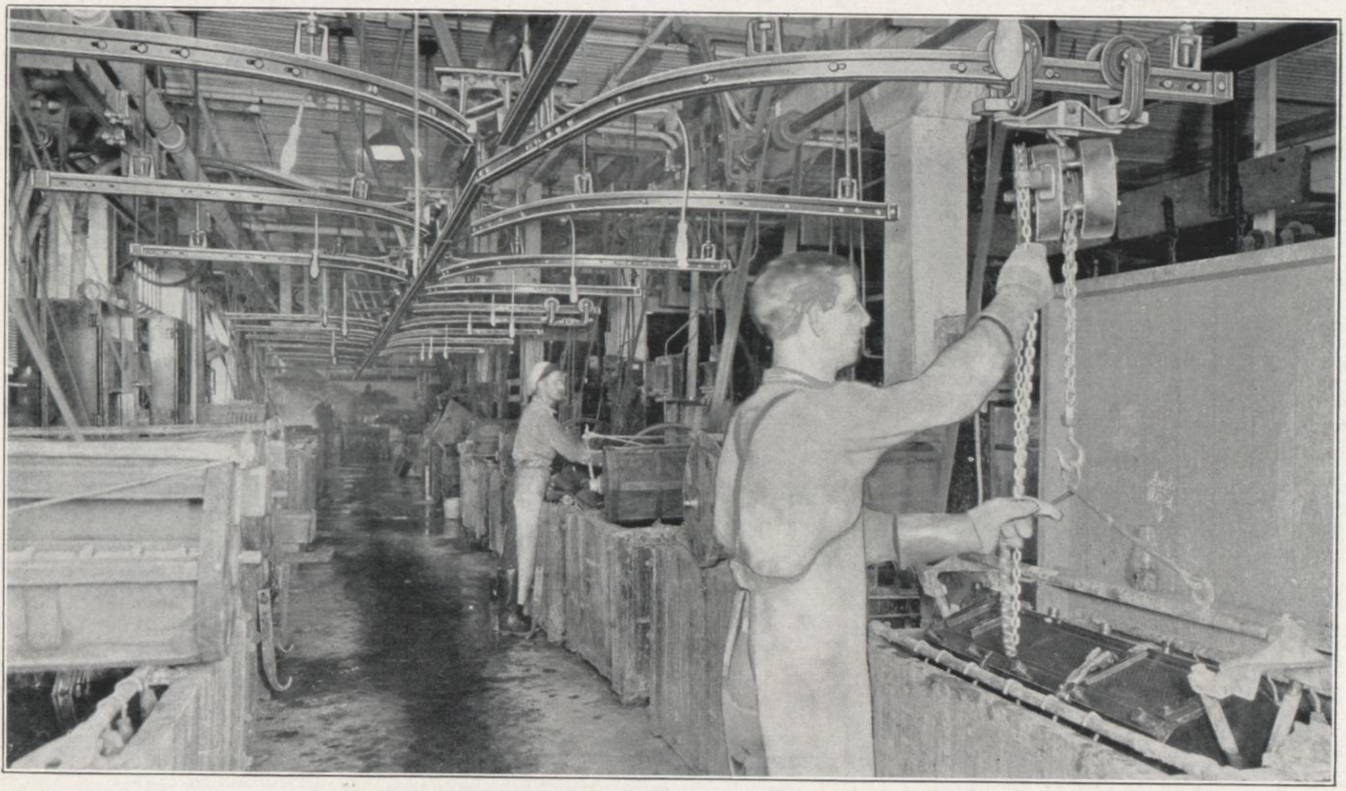


Fig. 31B *Flexibility of MonoRail shown by curves and switches in this installation in the plant of the Great Lakes Plating Company, Chicago. A spur is provided to serve each plating tank.*

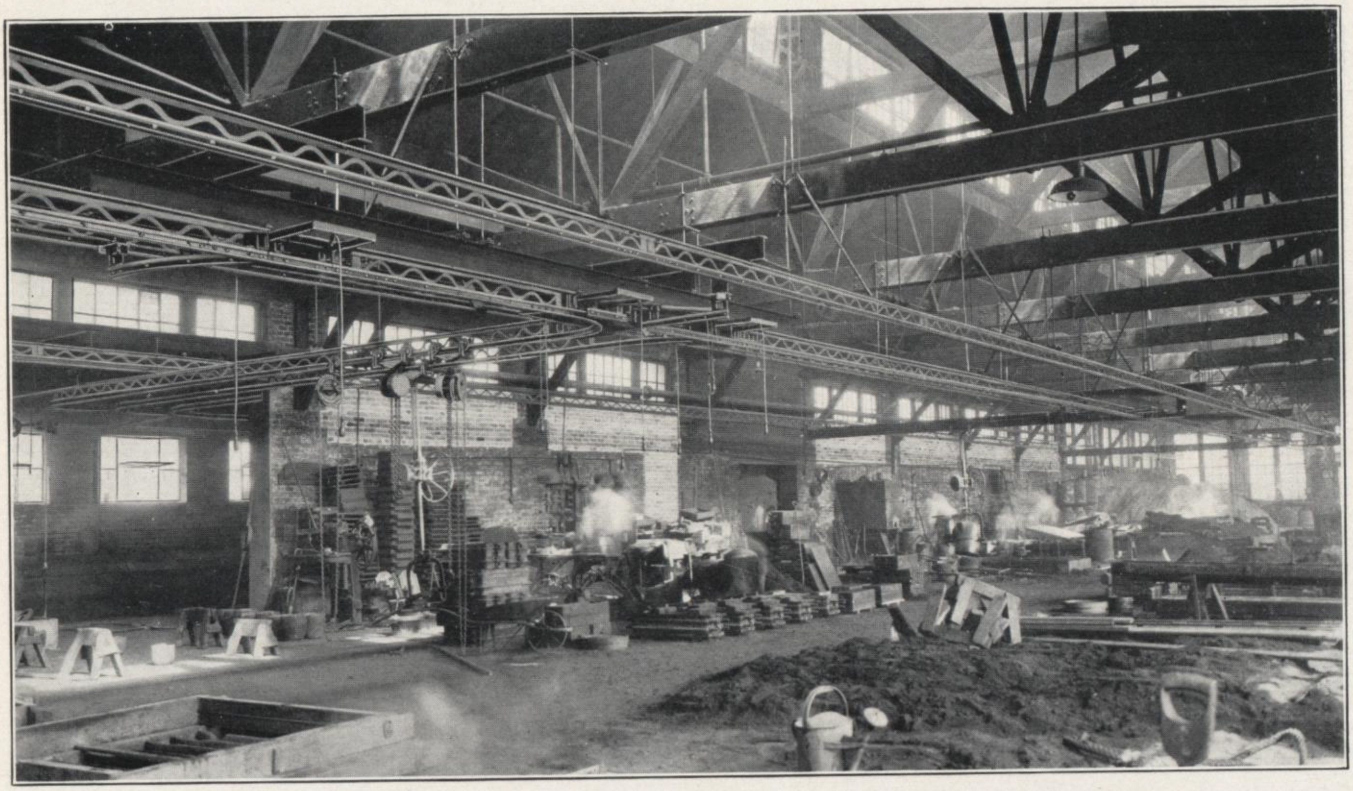


Fig. 32A *American Truss rail furnishes runway for trolleys and cranes handling ladles of hot metal to pouring floors in brass foundry of the Coleman Bronze Company, Chicago.*

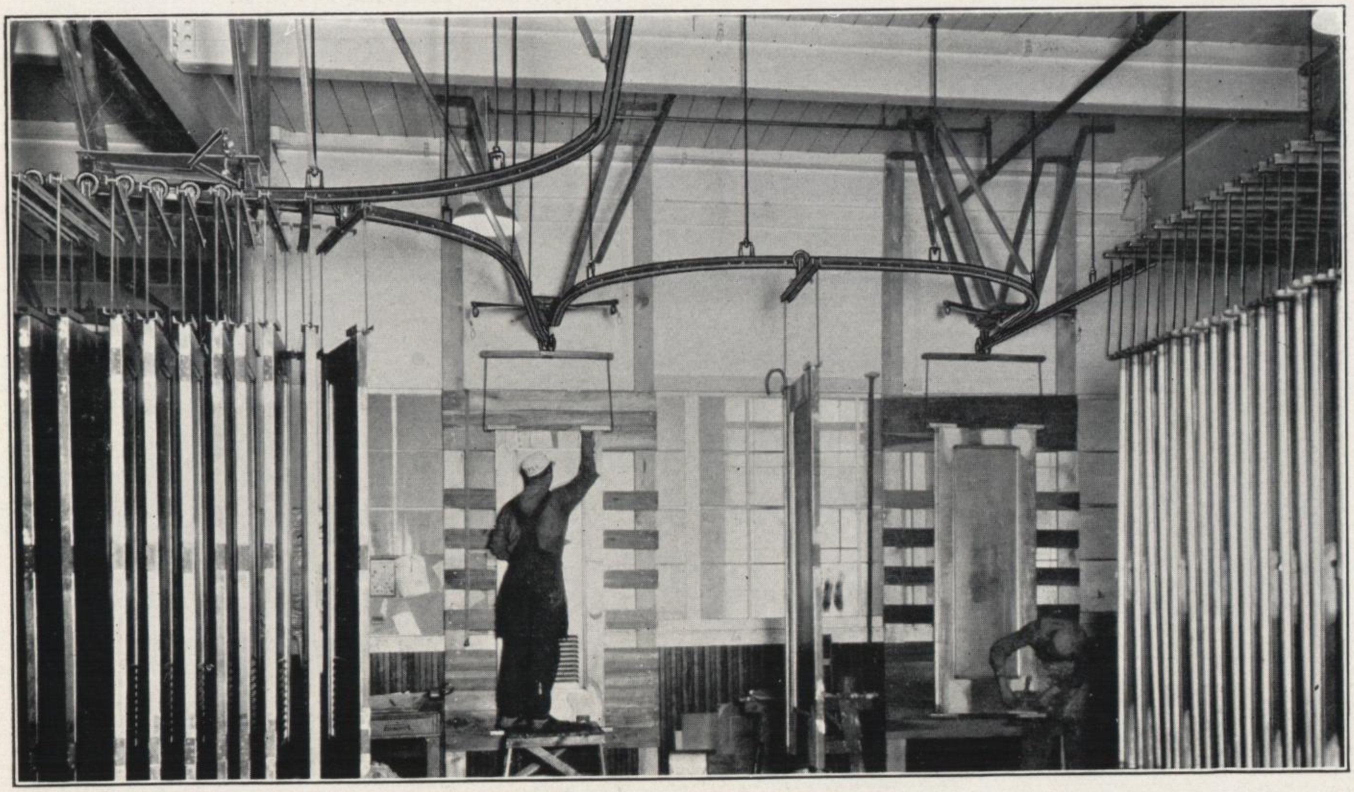


Fig. 32B *A fifty percent saving in labor cost in the operation shown in this illustration was effected by installing a MonoRail system for handling doors in the plant of the Steelbilt Products Corporation, Clifton, N.J.*

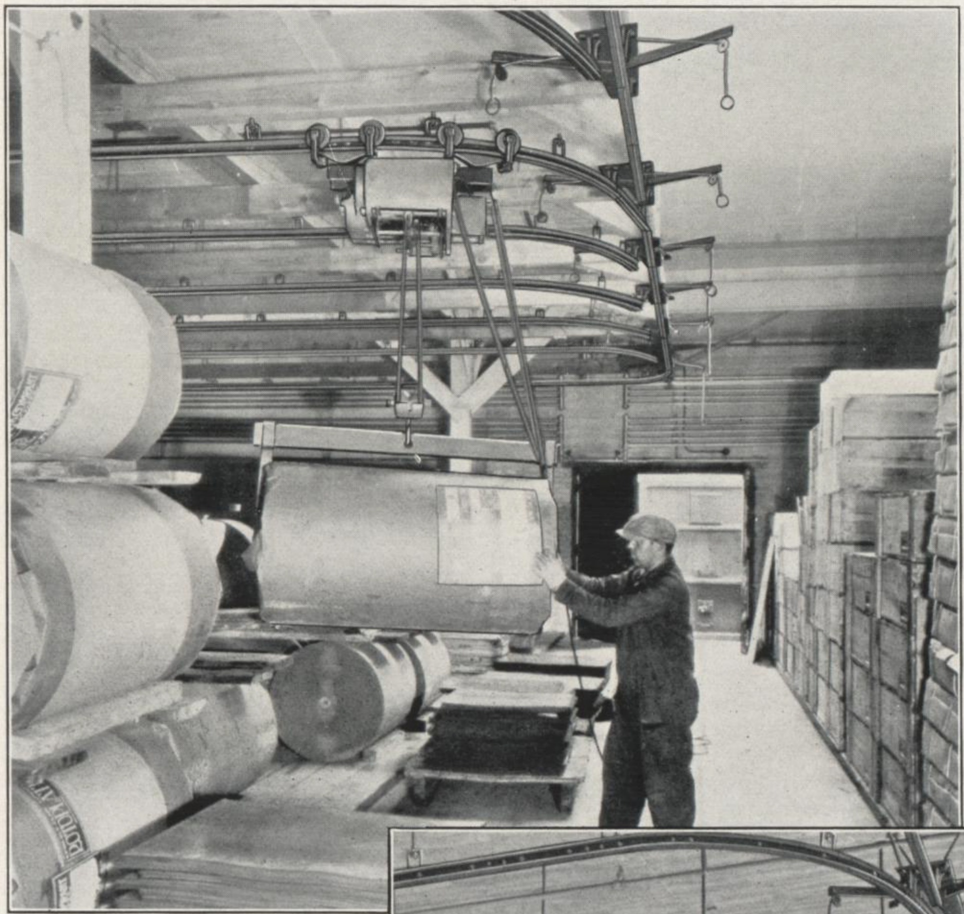


Fig. 33A

Battery of two-way tongue type switches in stock room of Brown & Bigelow, St. Paul, Minn. Handling paper by means of electric hoist and special grab.

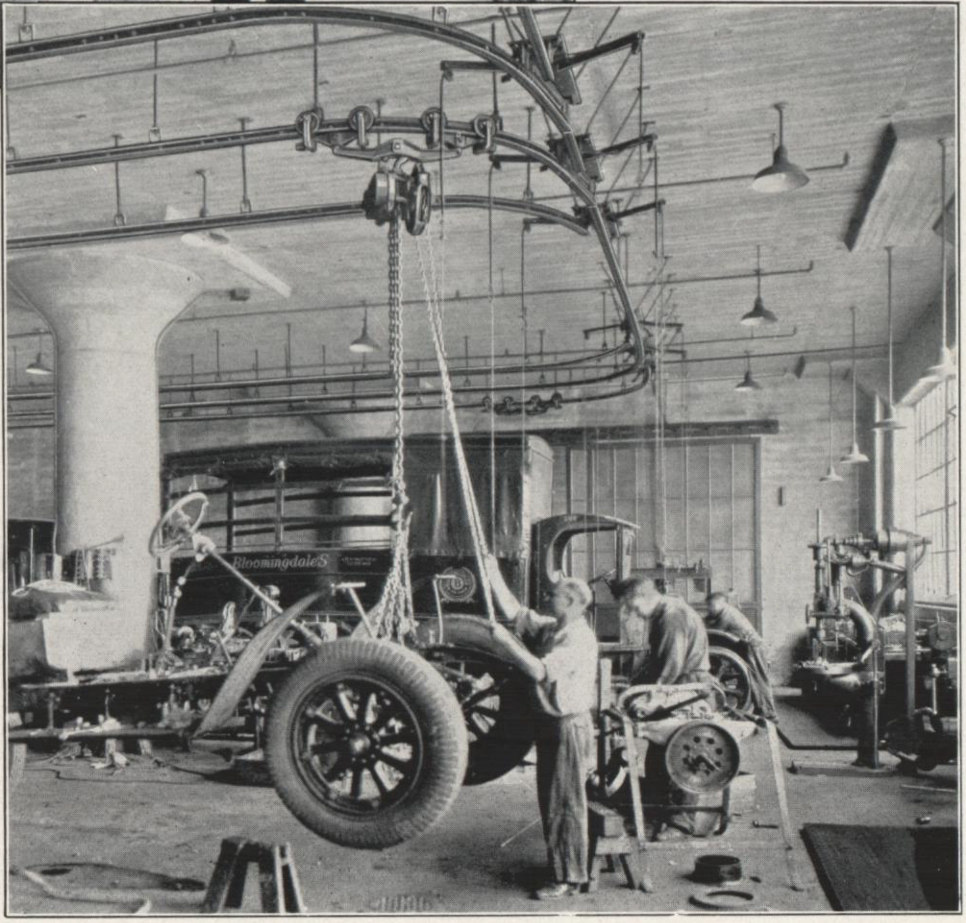
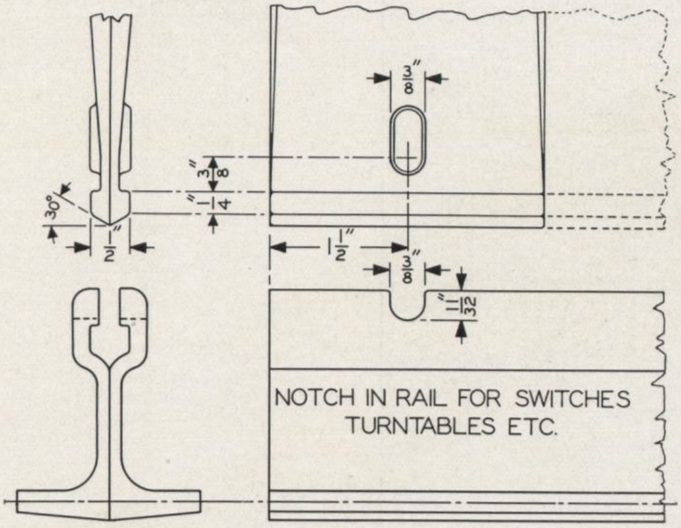


Fig. 33B

Two-way switches and track hung from inserts in concrete ceiling. Installation is used for repair of a large fleet of trucks operated by Bloomingdale Bros., Inc., New York City.

The Locking Lug



STANDARD LOCKING LUG AND NOTCH.
Fig. 34A

The method of locking the rail section connecting with MonoRail switches, cranes, turntables and lifts to prevent the connecting rail from crowding into and interfering with the moving rail section is a unique feature of American MonoRail equipment. This lock consists of a lug which is an integral part of the bracket supporting the connecting rail. The head of the connecting rail is notched to fit over this locking lug so that when the bolts are drawn up the rail is held rigidly in place. It can neither crowd into the moving rail section nor pull away and leave a wide rough joint.

This unique feature assures the proper operation of the moving rail section and smooth travel of trolleys over the rail joints.

A close-up view of the Locking Lug as it fits into the head of the connecting rail leading up to a switch. Note that the moving rail is welded to the bracket which supports it.

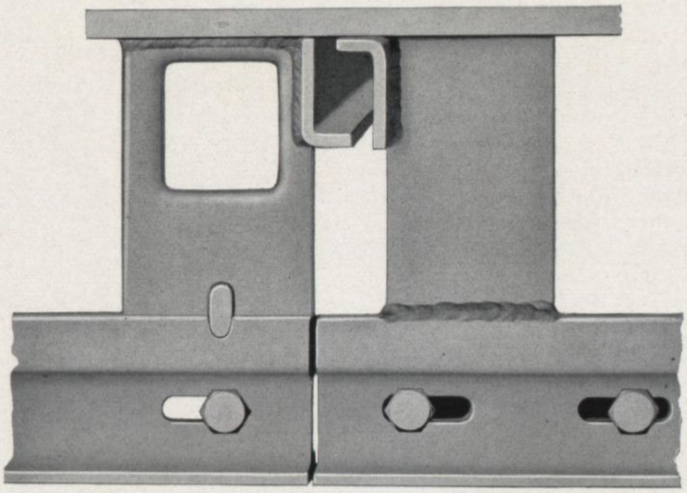


Fig. 34B

Rail section connecting with MonoRail cranes is shown on the left. Rail is held rigidly in place by the locking lug and cannot "creep" to interfere with the crane.

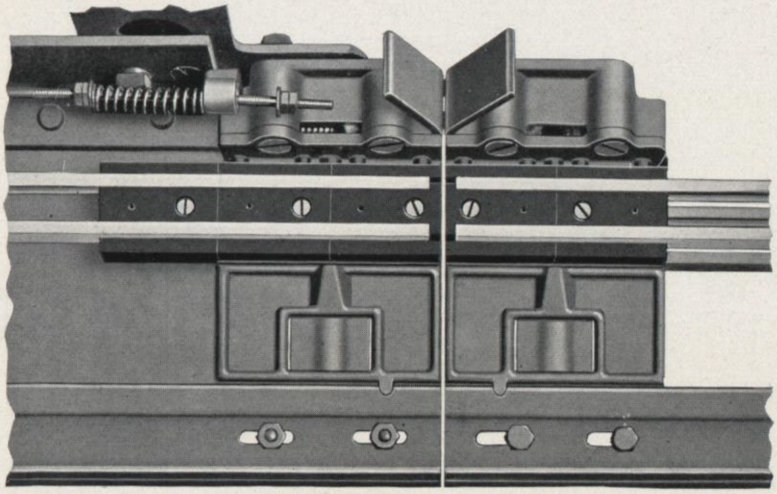


Fig. 34C

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

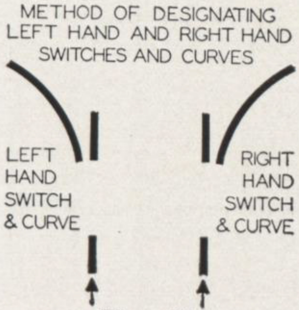
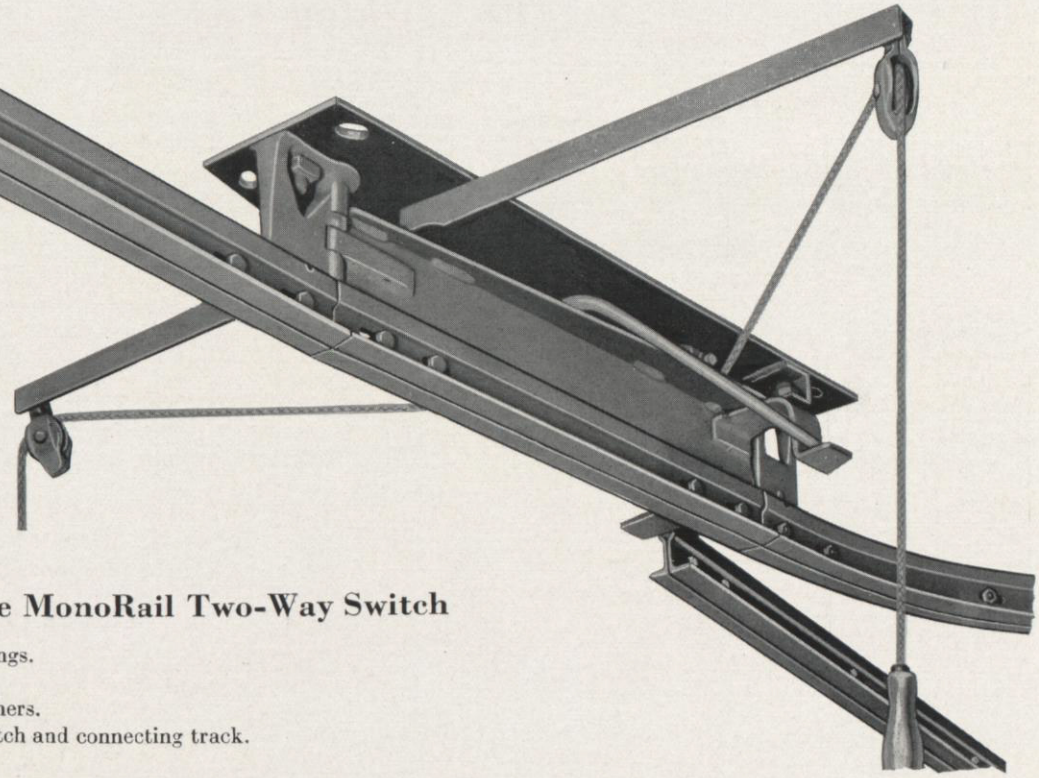


Fig. 35A



No. 260 Tongue Type MonoRail Two-Way Switch

Track support: Drop forgings.
Mounted on ⅜" steel plate.
All nuts secured with nut washers.
Accurate register between switch and connecting track.
Positive latch.
Safety stop guards open rail.
Switch ropes: Heavy sash cord, standard length, 3 feet.
Rope pulleys: Special design, malleable iron.
Pulley supports: Heavy angle iron.
Finish: Green Enamel.
Weight: 68 pounds.

American MonoRail tongue type switches embody these distinctive features among others—the steel plate mounting, the drop forged and rolled steel supporting members; the positive lock against crowding by connecting track, the safety guards at open rails, and the positive latch which holds switch tongue in desired position.

The heavy steel plate mounting provides an easy method of attaching switch to any type of supporting beam. The plate is drilled for anchoring bolts and when it is in place, the switch is as solid and rigid as the supporting superstructure.

The switch members to which connecting track is attached are provided with lugs fitting into notches in the track. The switch tongue is a welded member. This feature insures free and easy operation of the switch by maintaining sufficient clearance for the tongue, preventing crowding or binding by the shifting of connecting track. A slight pull on the switch rope quickly and easily shifts the switch tongue to the desired position.

It is impossible for trolleys to leave the track on a MonoRail switch. Open tracks are protected in every position of the switch by guards attached to the switch tongue.

If switch rope longer than standard is required, it should be so specified.

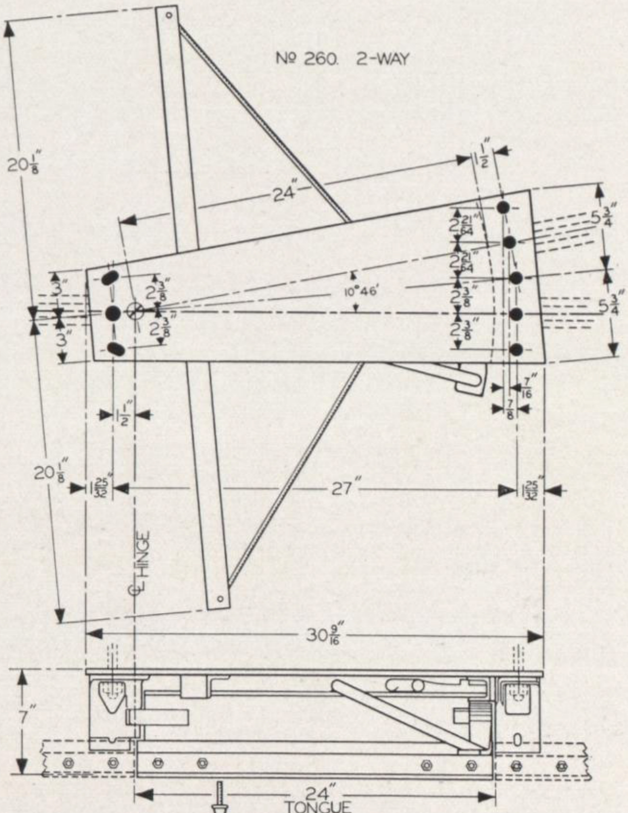


Fig. 35B

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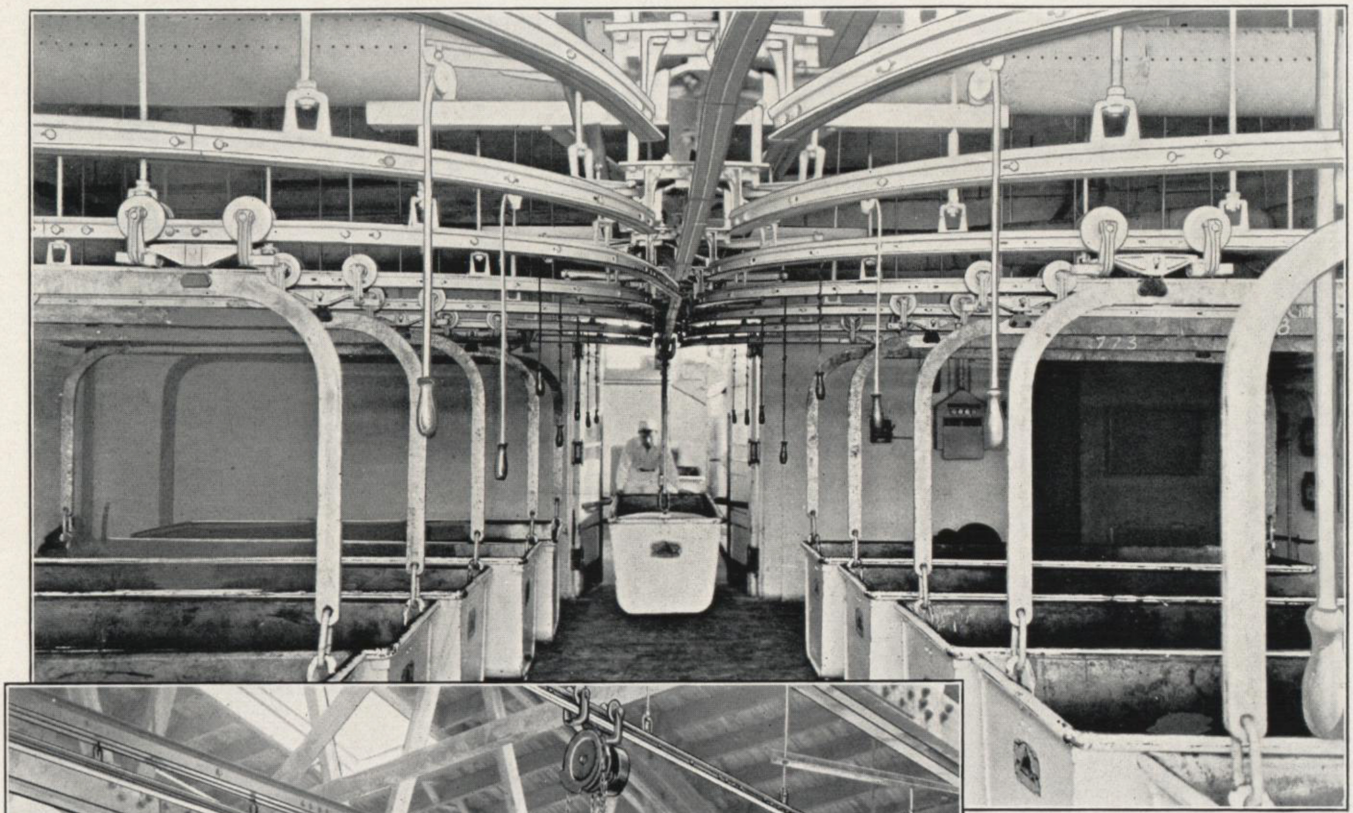


Fig. 36A

Above—*Battery of three-way tongue-type switches in the McGough Bakery, Birmingham, Alabama. Tracks used for storage of dough troughs. System extends over other floors and includes scales for weighing batches.*

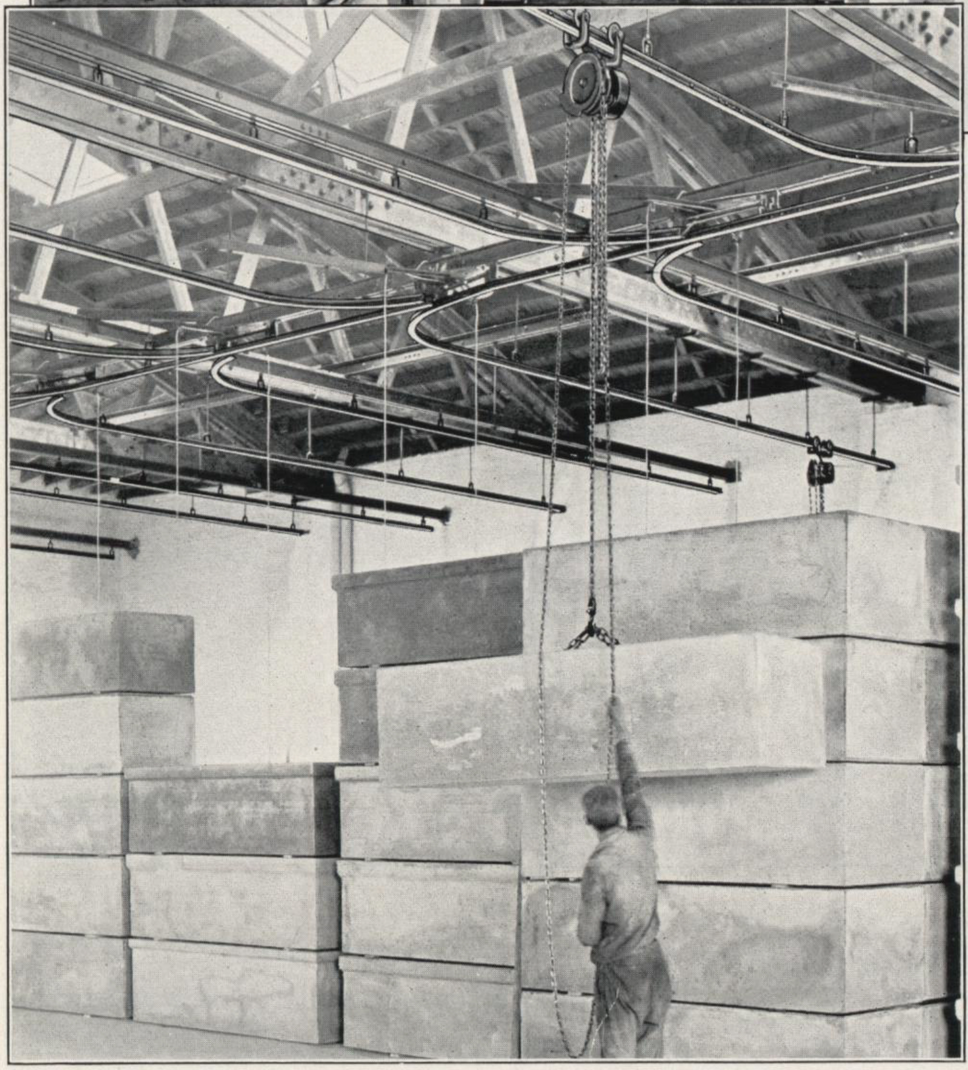
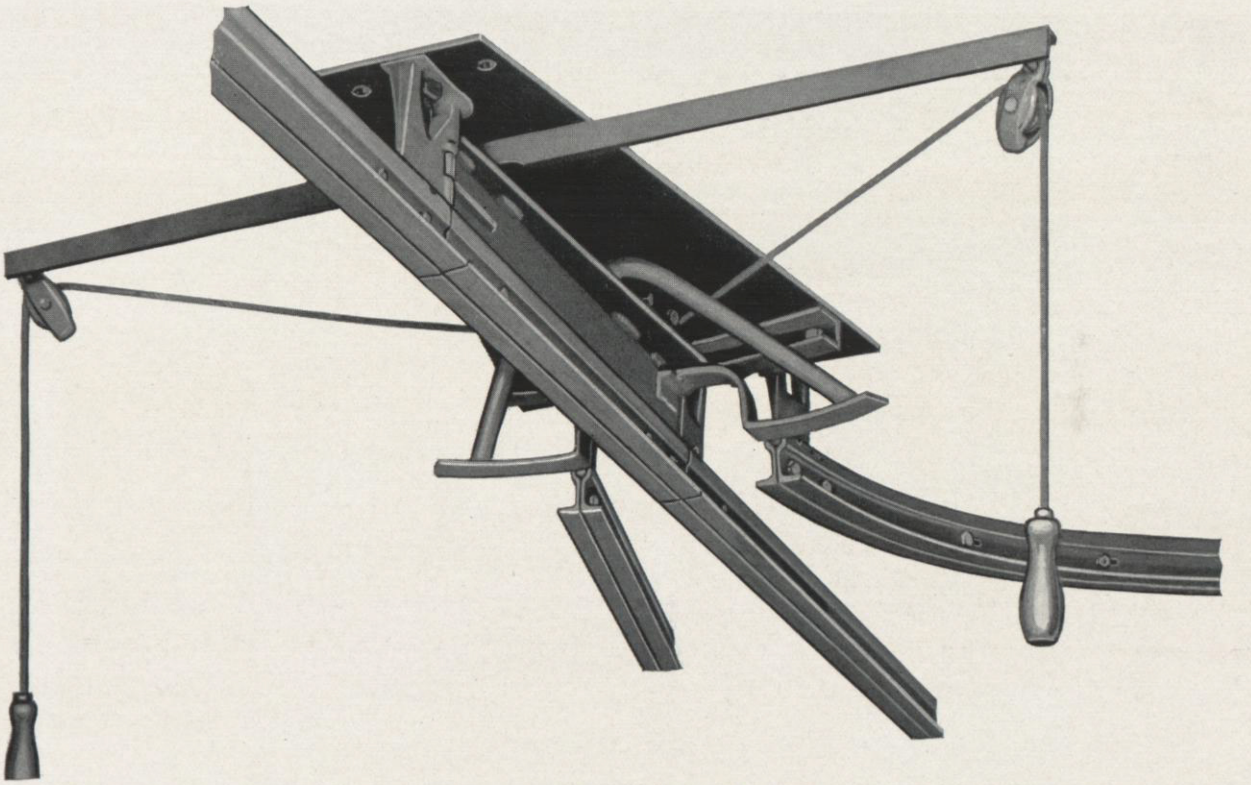


Fig. 36B

Left—*Three-way tongue type switches permitting close tiering of vaults in the plant of the Seal Lock Burial Vault, Inc., Forest Hills, L. I.*



No. 261 Tongue Type MonoRail Three-Way Switch

Specifications

Track supports: Drop forgings.
Mounted on 3/8″ steel plate.
All nuts secured with lock washers.
Accurate register between switch tongue and connecting track.
Positive latch.
Safety stops guard all open rails.
Switch ropes: Heavy sash cords, standard length, 3 feet.
Rope pulleys: Special design, malleable iron.
Pulley supports: Heavy angle iron.
Finish: Green Enamel.
Weight: 80 pounds.

The MonoRail three-way switch illustrated above embodies all the design, construction and safety characteristics of the two-way switch described on page 35.

Attention is especially called to the latching feature in the three-way switch. The switch tongue is shown in latched position with the middle meeting rail. When the switch tongue is moved from the right or left hand rail to the center position, it latches positively in the intermediate position requiring another pull on the rope to release the latch and move the tongue to the desired position.

The positive stop in the middle position is an important feature since it would be difficult to spot the switch arm for the intermediate track if it could be pulled directly through that position.

The protection afforded to open tracks is plainly shown in the illustration above. Safety stops, attached to switch tongue, provide positive insurance against trolleys leaving track at switches.

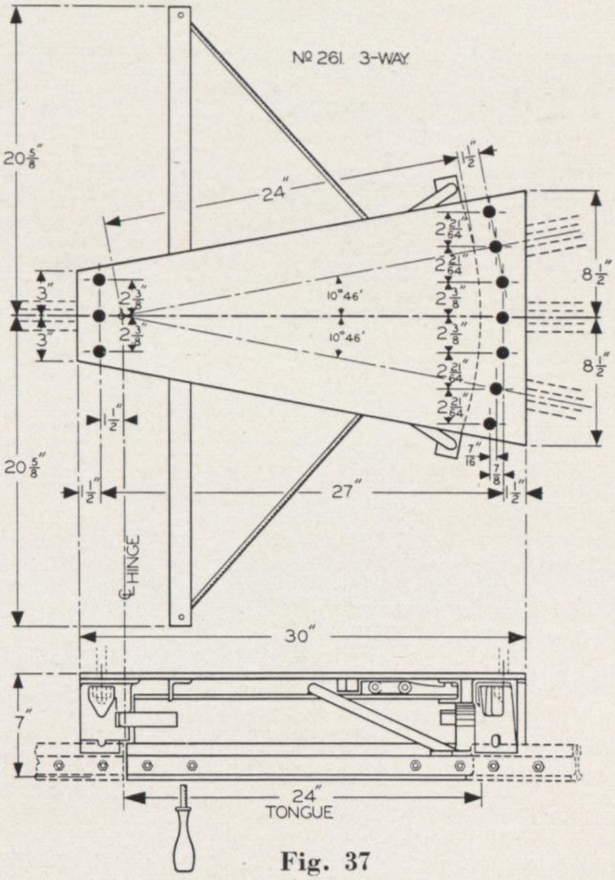


Fig. 37

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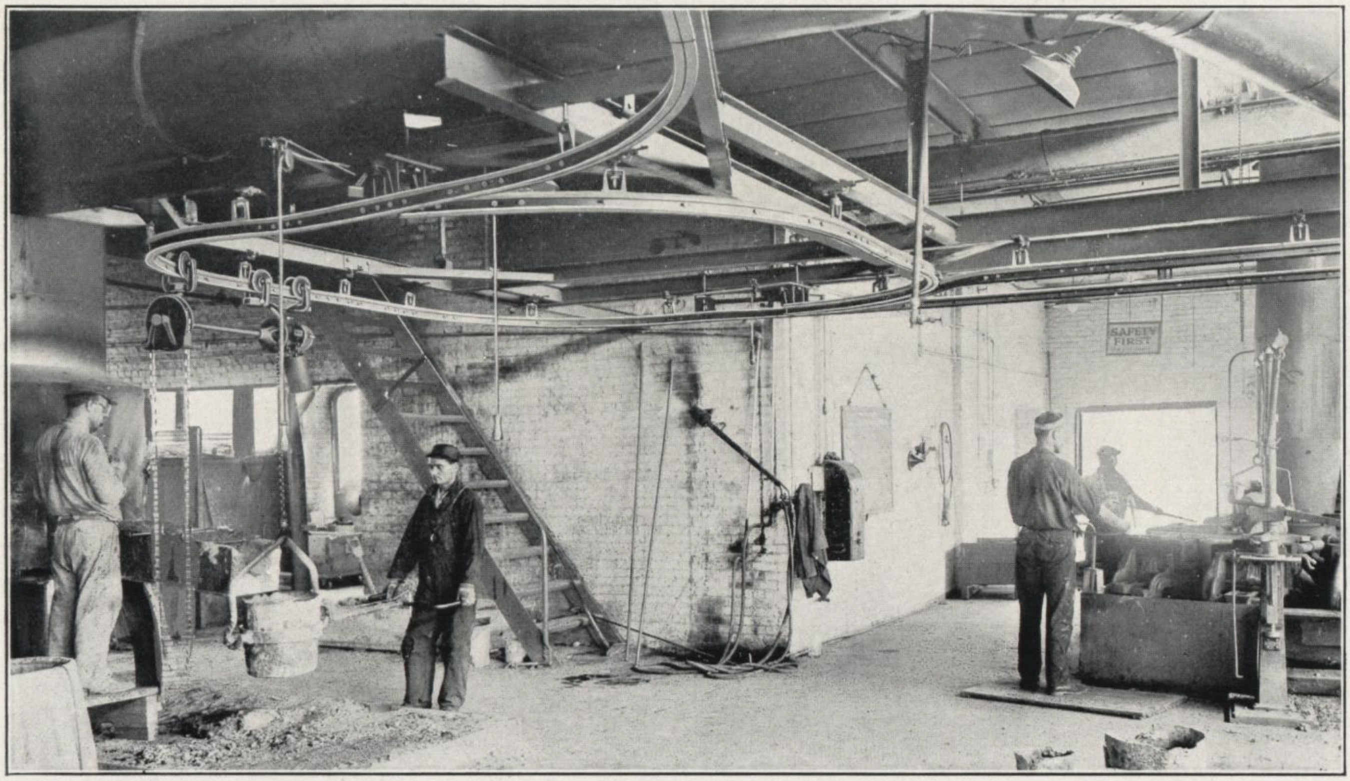


Fig. 38A *Flexibility of MonoRail shown by loop at cupola and connecting tracks in the foundry of the Edison Electric Appliance Company at Chicago. MonoRail layout permits continuous pouring.*

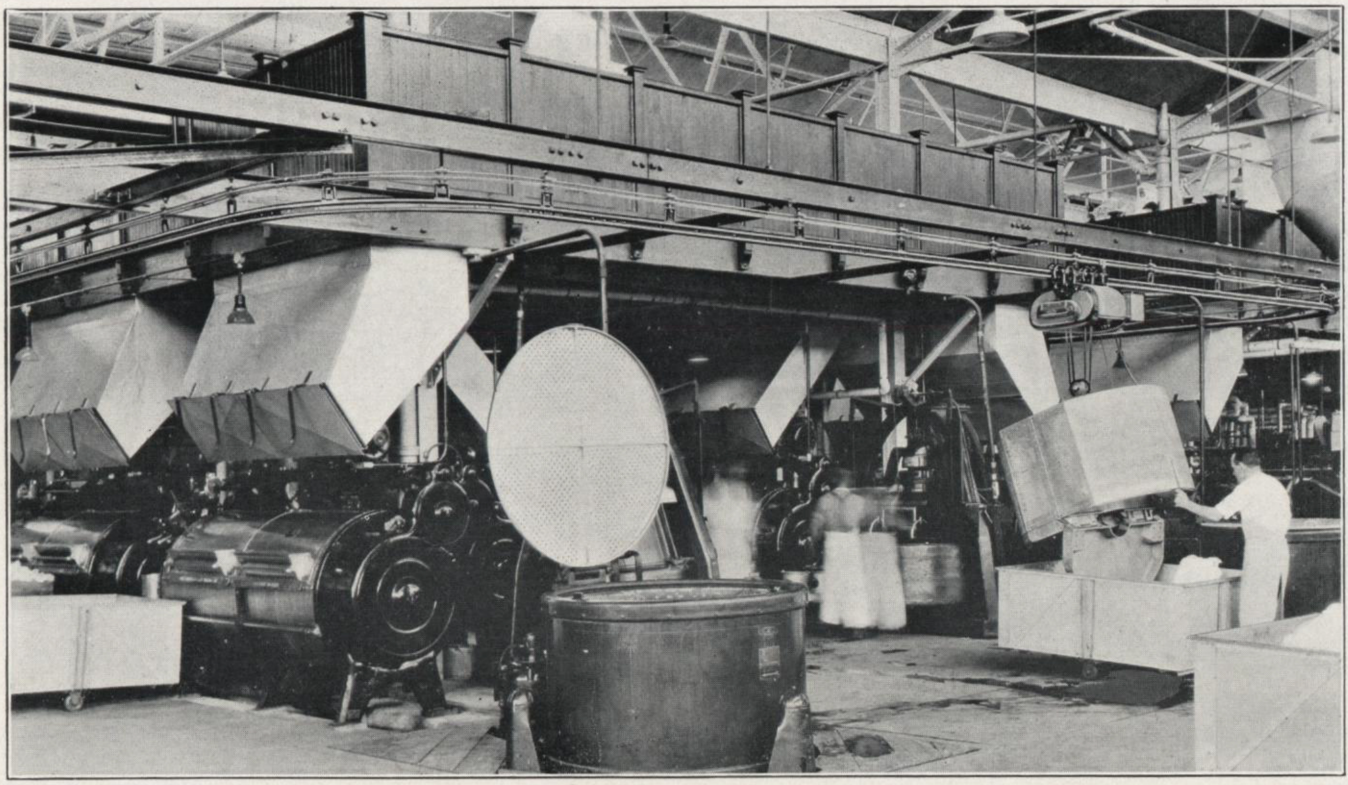
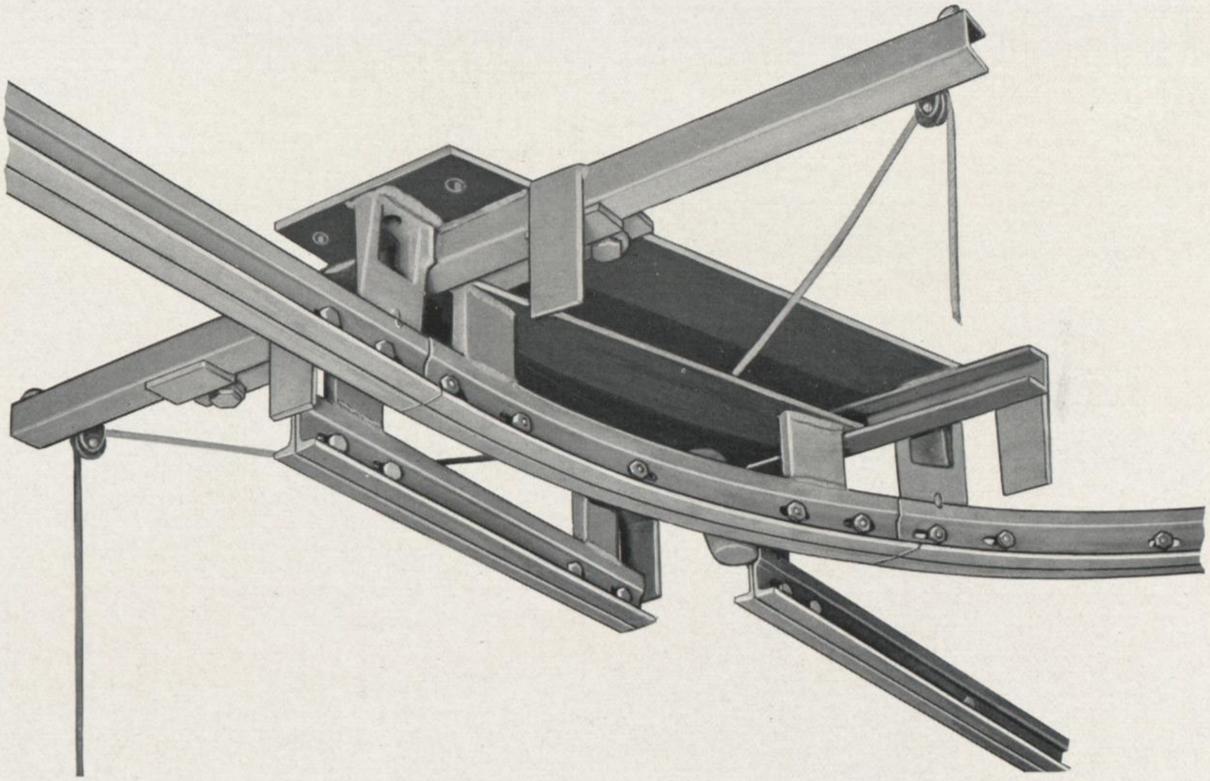


Fig. 38B *MonoRail system in the Morey LaRue Laundry Co., Linden, N. J. System electrified for hoist operation in handling extractor baskets. Baskets are swiveled for ease in dumping both sides.*



No. 293 Glide Type MonoRail Two-Way Switch

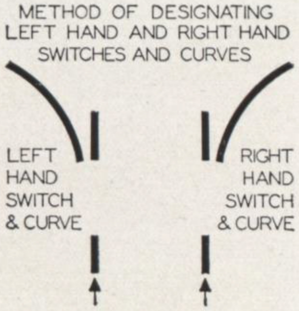

METHOD OF DESIGNATING LEFT HAND AND RIGHT HAND SWITCHES AND CURVES
LEFT HAND SWITCH & CURVE
RIGHT HAND SWITCH & CURVE

Fig. 39A

Specifications

All load-carrying members: Drop forgings and rolled steel.
Mounted on $\frac{3}{8}''$ steel plate.
All nuts secured with lock washers.
Accurate register between shift section and connecting track.
Positive latch.
Safety stops guard all open rails.
Switch ropes: Heavy sash cords, standard length, 3 feet.
Rope pulleys: Special design, malleable iron.
Pulley supports: Heavy angle iron.
Finish: Green Enamel.
Weight: 110 pounds.

Greatly increased flexibility for the MonoRail System has been gained by the development of the glide type switch, as by its use branch tracks with a spacing of only two feet, three inches are secured. For examples of possible close clearances obtained by the use of glide type switches see diagram on page 169. Trolleys travel easily and smoothly through the curved section of glide type switches.

A slight pull on the switch rope moves the switch to either position, where a positive latch holds it in place for the passage of trolleys.

All open tracks are guarded by safety stops so that it is impossible for trolleys to leave the track.

Crowding and interference with shift section by connecting track is prevented by lugs on track suppports.

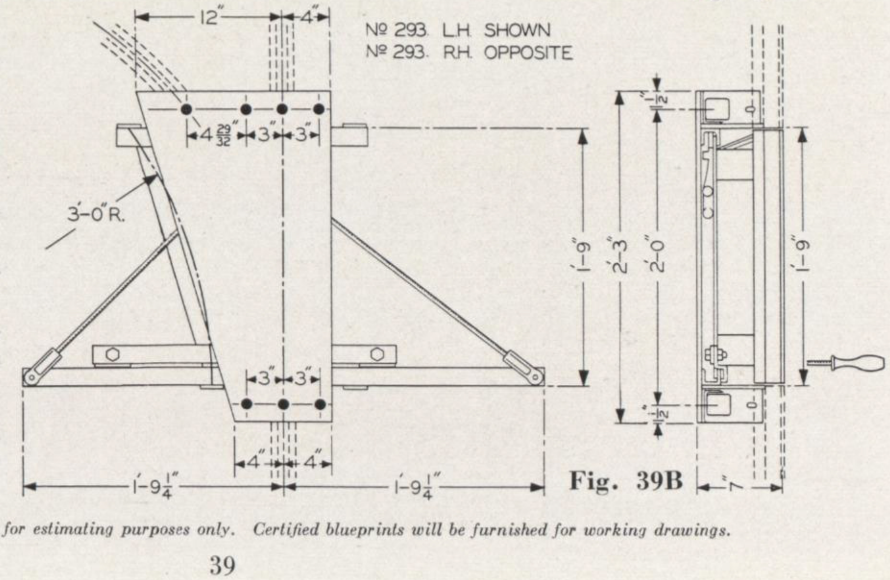


Fig. 39B

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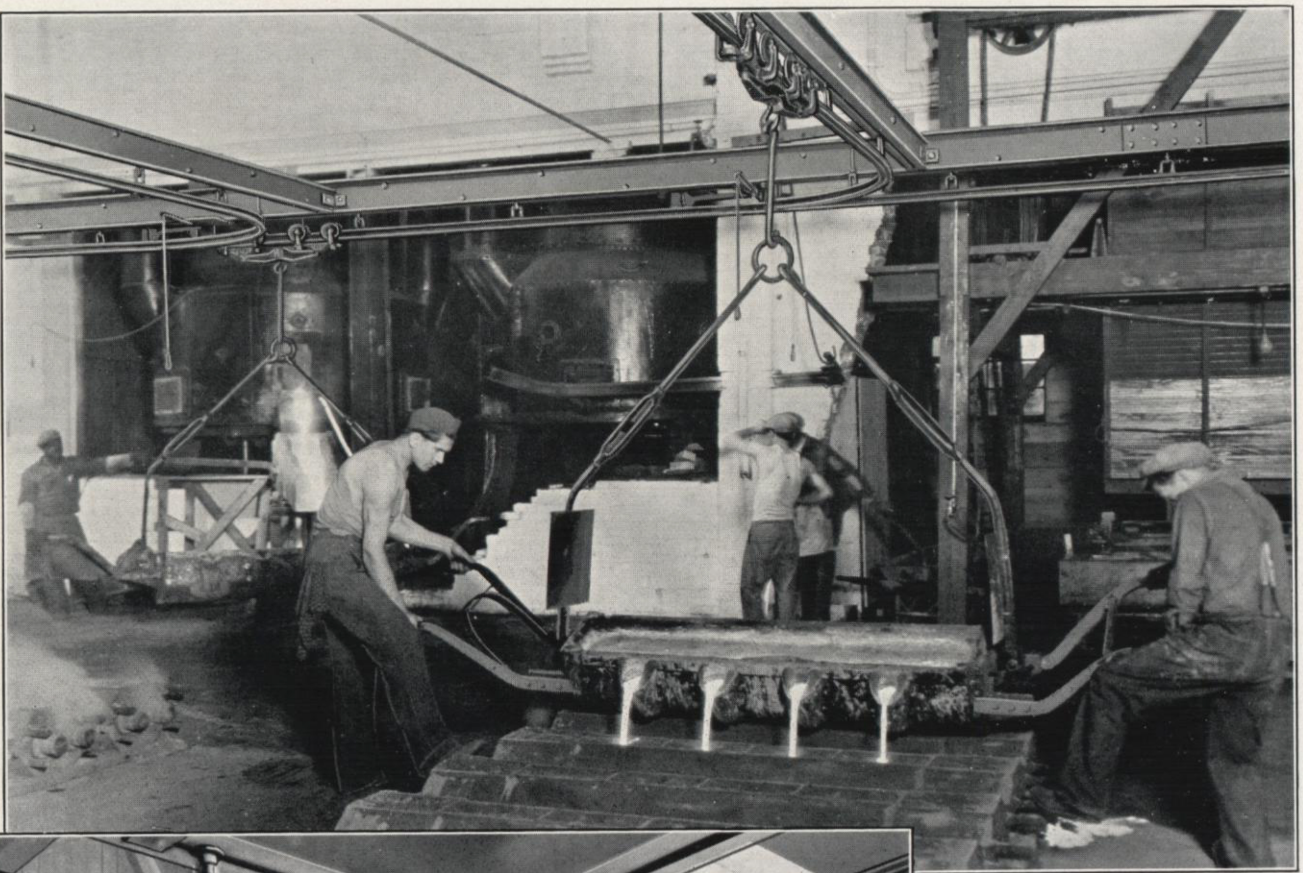


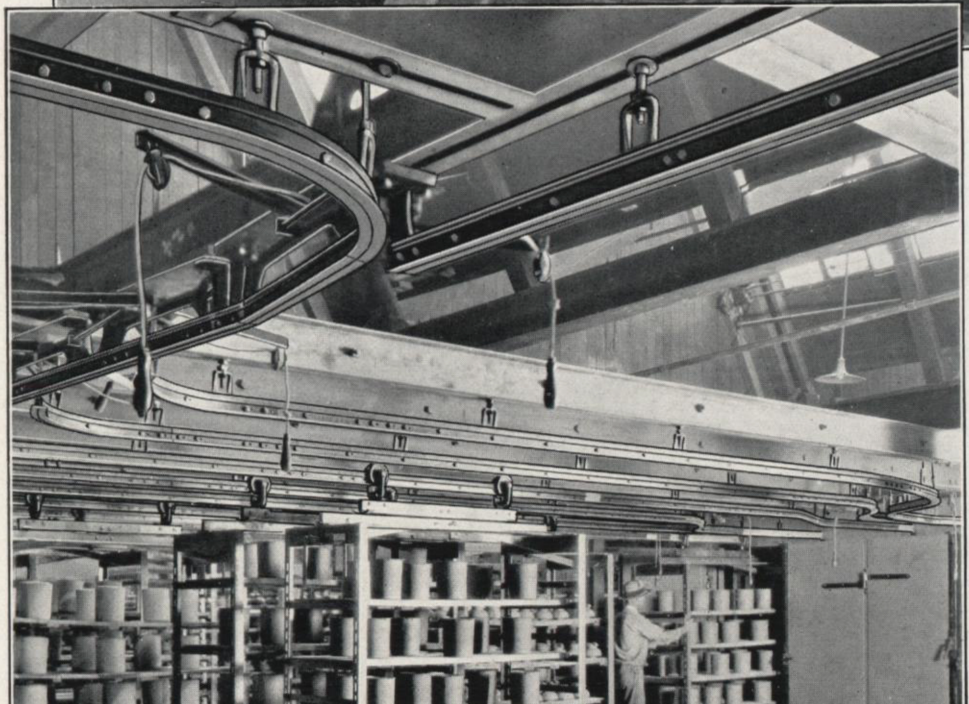
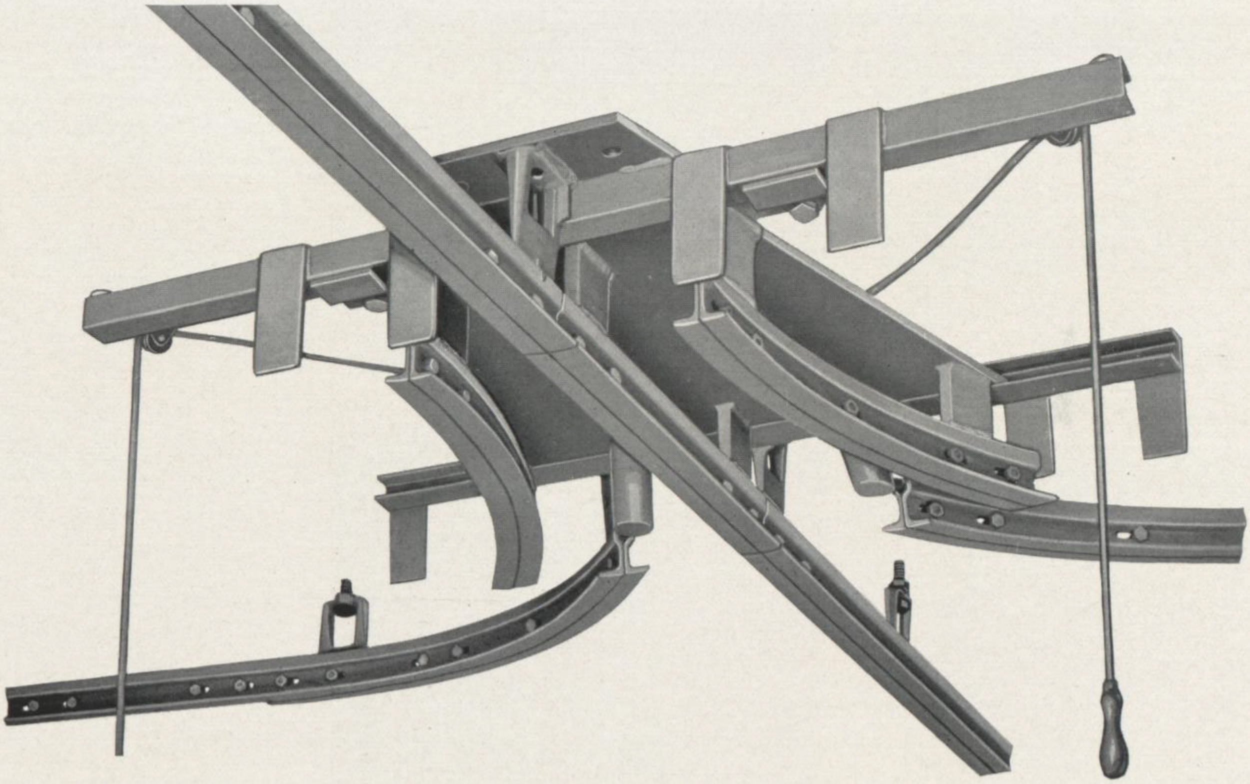


Fig. 40A

Above—*A heavy-duty MonoRail installation in the plant of the Buffalo Pipe & Foundry Co., Buffalo, N. Y. Special four-lipped ladle carried from cupola to pipe moulds by MonoRail trolleys.*

Fig. 40B

Left—*MonoRail system handling loaded racks through drver in plant of Locke Insulator Corporation, Baltimore, Md. Doors of dryer equipped with closures around MonoRail track.*



No. 294 Glide Type MonoRail Three-Way Switch

Specifications

All load-carrying members: Drop Forgings and rolled steel.
Mounted on ⅜″ steel plate.
All nuts secured with lock washers.
Accurate register between shift section and connecting track.
Positive latch.
Safety stops guard all open rails.

Switch ropes: heavy sash cords, standard length, 3 feet.
Rope pulleys: special design, malleable iron.
Pulley supports: heavy angle iron.
Finish: Green Enamel.
Weight: 158 pounds.

The parts of glide type MonoRail three-way switches are mounted on heavy steel plates which insure level joints at meeting rails. The plate mounting also greatly simplifies the installation of MonoRail switches.

Approaching tracks are prevented from crowding the glide section by lugs in the drop forged track supports.

A positive latch holds switch in any position until released by a pull on switch rope. This is especially important in shifting to the intermediate position. The switch latches at this point requiring another pull on the rope to shift to other positions.

All open tracks are protected by safety stops. Trolleys cannot leave track at switches.

MonoRail switches of the Glide Type add greatly to the adaptability and flexibility of MonoRail Systems where close spacing of branch tracks is desirable.

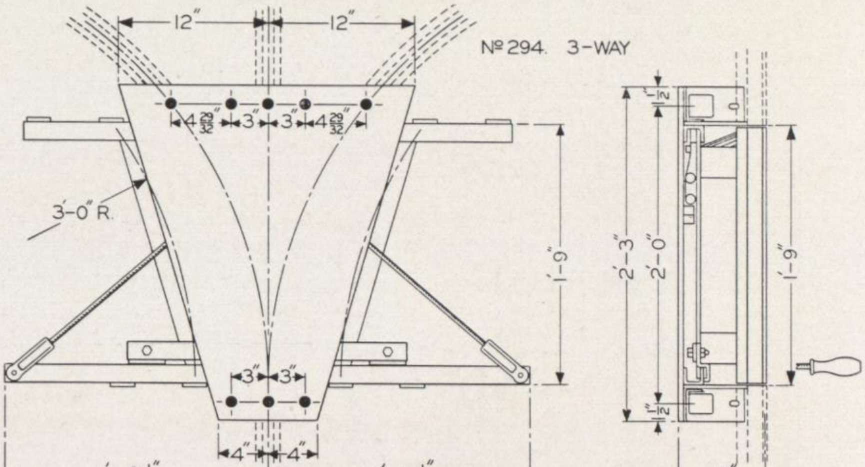


Fig. 41

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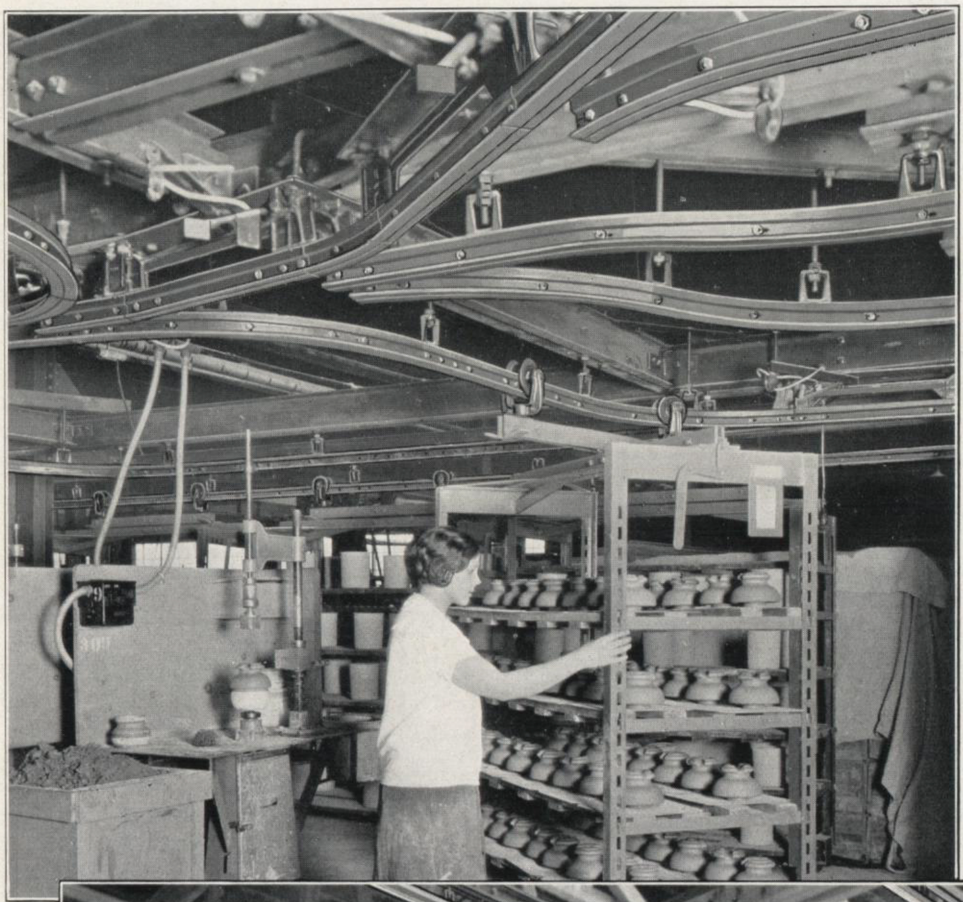
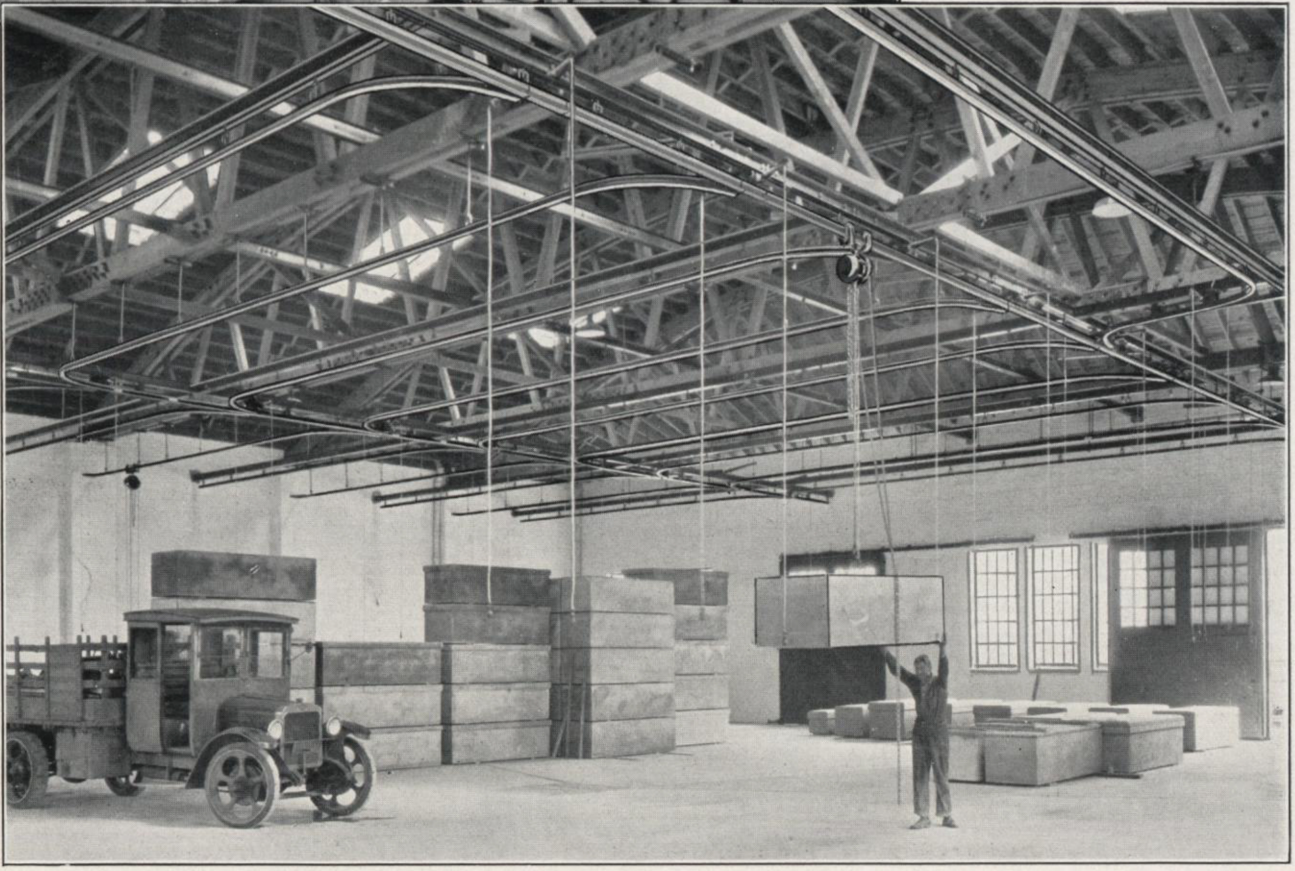


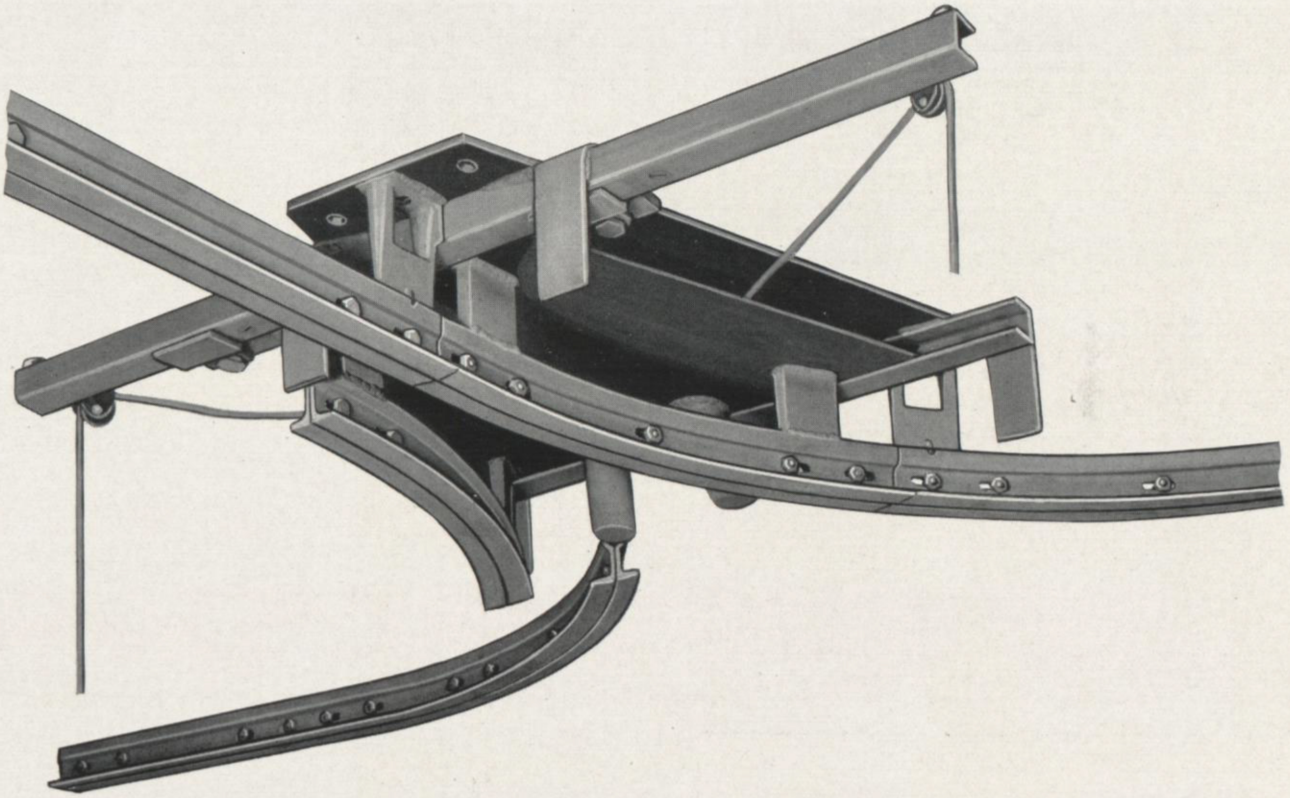
Fig. 42A

Left—*Switches and track in MonoRail installation in plant of Locke Insulator Corp., Baltimore, Md. Ease of propelment of MonoRail trolleys is illustrated by the fact that girl operators handle these loaded racks without difficulty.*

Fig. 42B

Below—*Series of switches which form part of system in storage room of Seal Lock Burial Vault, Inc., Forest Hills, Long Island.*





No. 295 Glide Type MonoRail Wye Switch

Specifications

All load-carrying members: Drop forgings and rolled steel.
Mounted on $\frac{3}{8}''$ steel plate.
All nuts secured with lock washers.
Accurate register between shift section and connnecting track.
Positive latch.
Safety stops guard all open rails.

Switch Ropes: heavy sash cord, standard length, 3 feet.
Rope pulleys: special design, malleable iron.
Pulley supports: heavy angle iron.
Finish: Green Enamel.
Weight: 140 pounds.

The erecting of MonoRail glide type switches is greatly simplified by the provision made for anchoring bolts by holes drilled in the heavy steel plate on which switch members are mounted. Switches may be attached to any type of beam—I-beam, channel support, or wood beam, or may be supported by suspension bolts. This method of installation makes the switch and connecting track as solid and rigid as the supporting superstructure. The top plate keeps dust and dirt from working parts.

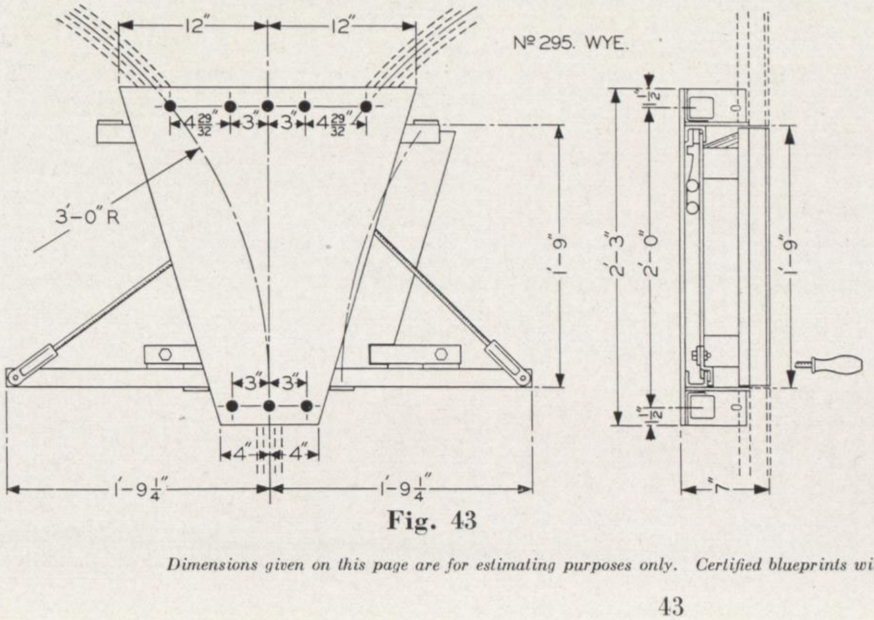


Fig. 43

The Wye Switch furnishes connection with diverging lines on either side of the center line of the switch.

It embodies all the advantages of the Glide Type Switch—ease of manipulation, smooth curves for trolley travel, perfect register of shift section with connecting tracks, and provision against crowding by outside track.

Positive latching in both operating positions, and safety stops always guarding all open track are safety features.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

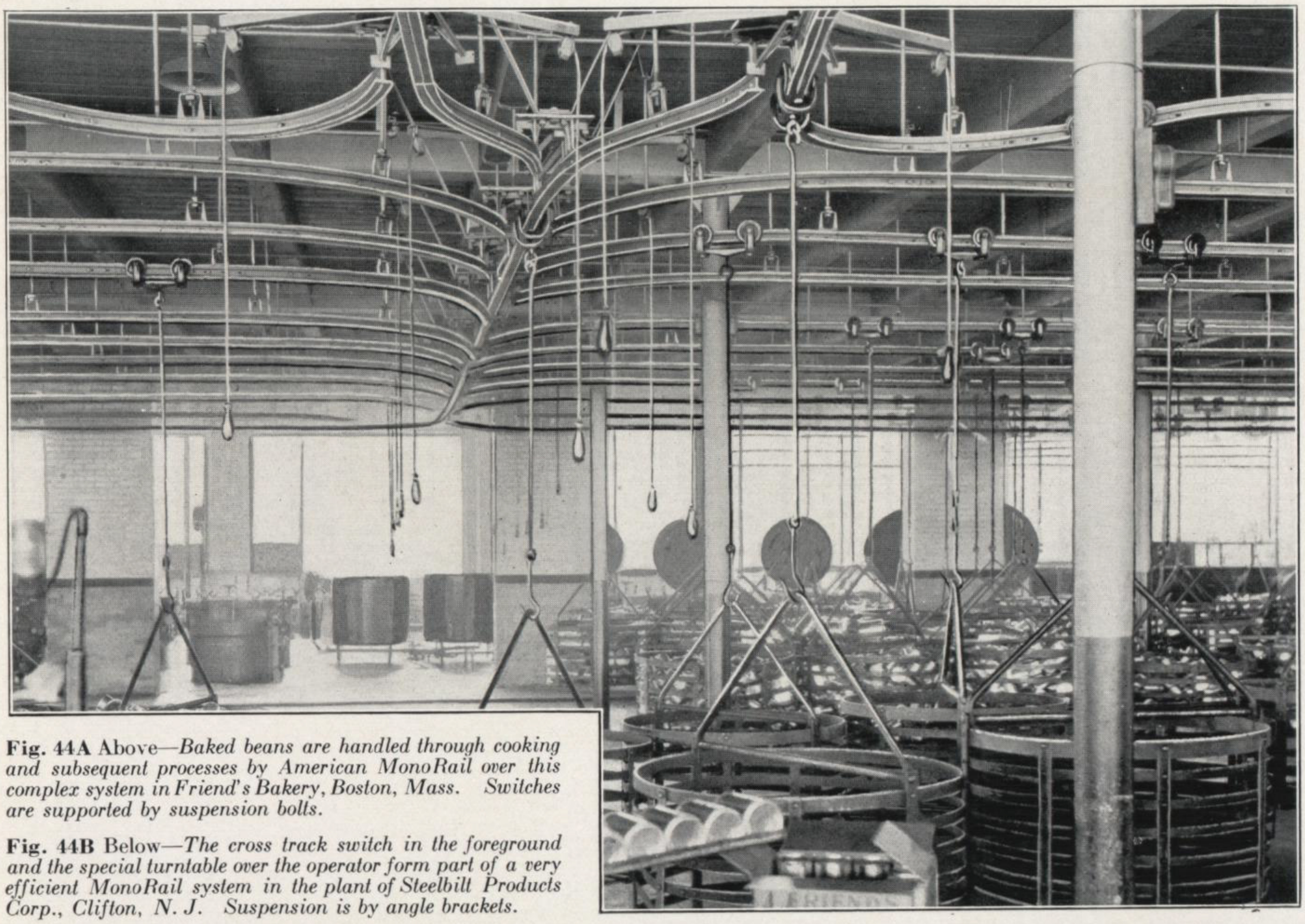
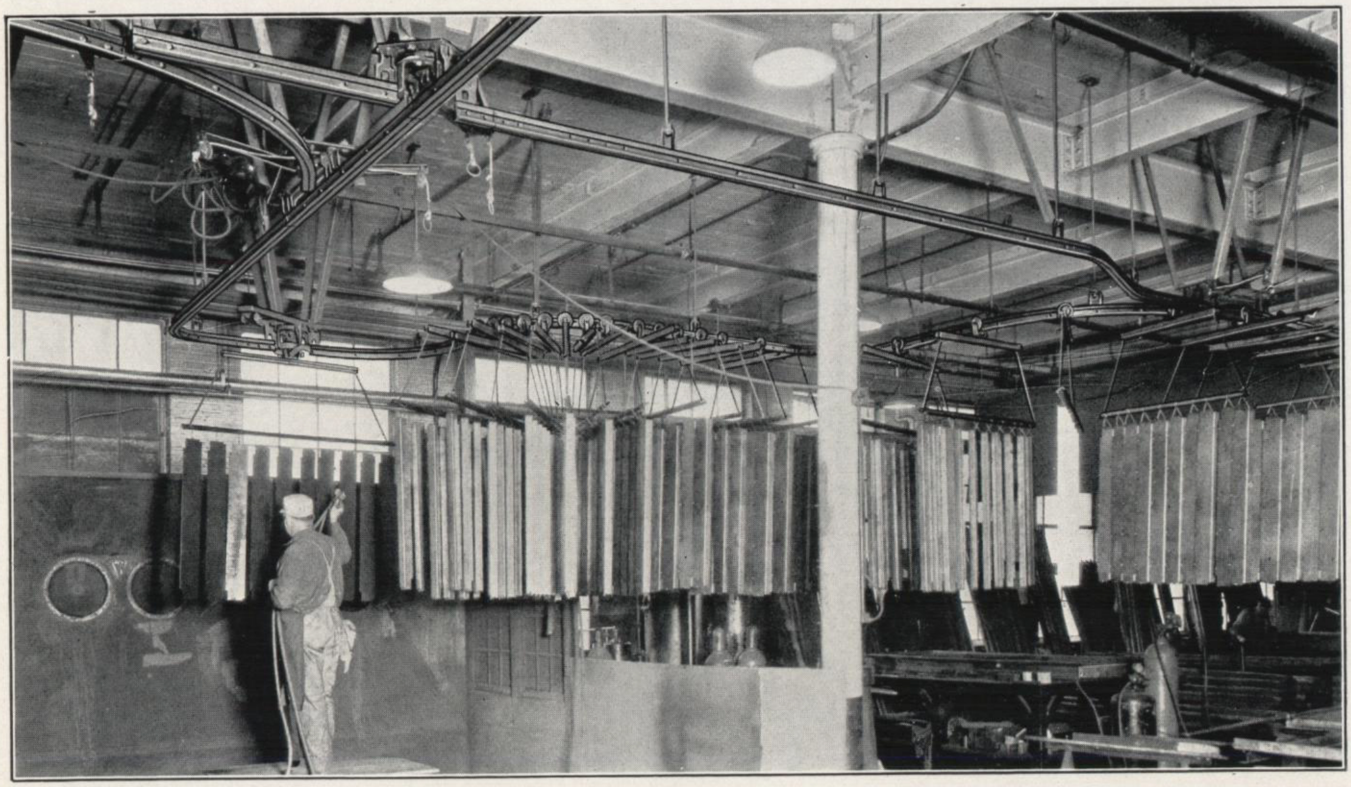
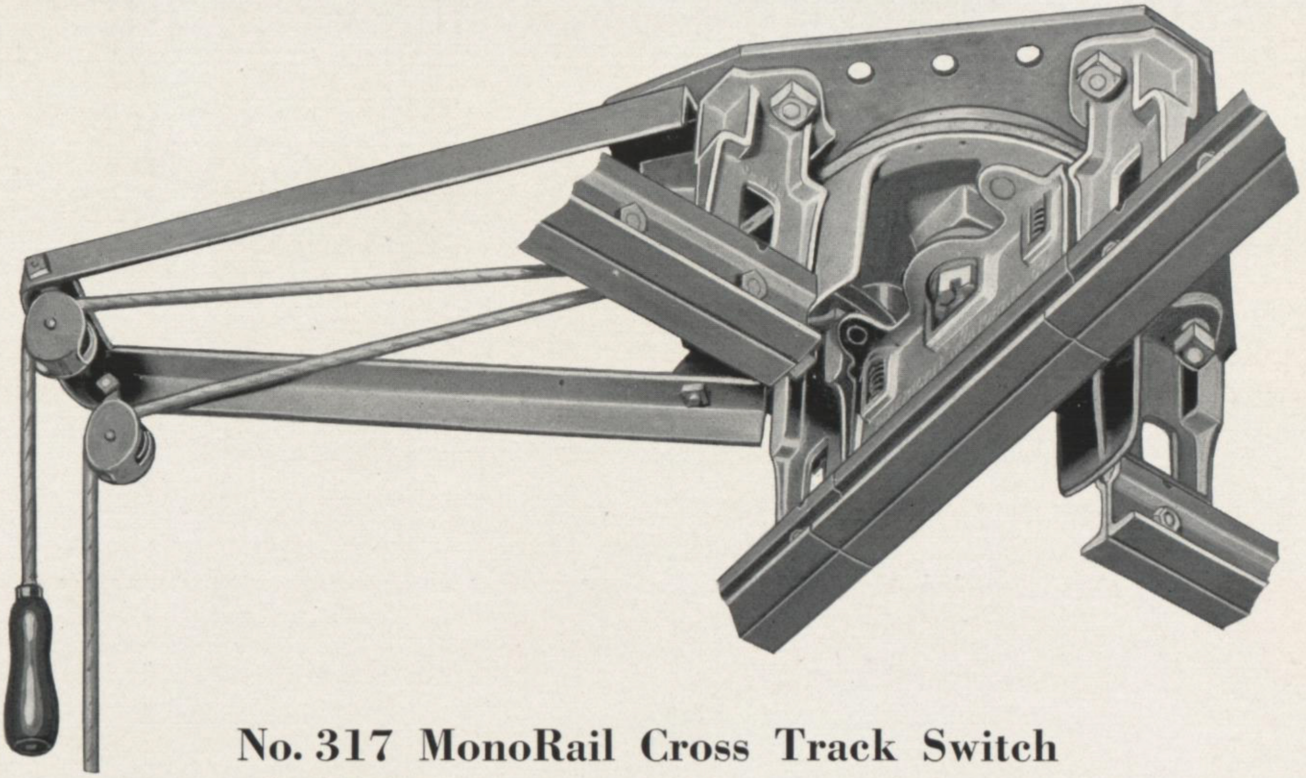


Fig. 44A Above—*Baked beans are handled through cooking and subsequent processes by American MonoRail over this complex system in Friend's Bakery, Boston, Mass. Switches are supported by suspension bolts.*

Fig. 44B Below—*The cross track switch in the foreground and the special turntable over the operator form part of a very efficient MonoRail system in the plant of Steelbilt Products Corp., Clifton, N. J. Suspension is by angle brackets.*





No. 317 MonoRail Cross Track Switch

Specifications

Operating parts, malleable iron.
Parts mounted on heavy malleable plate.
Swing bar carried on roller thrust bearings.
Switch operates easily under load.
Pull rope, heavy sash cord, standard length, 3 feet.
All nuts secured with lock washers.
Open rail ends automatically guarded.
Approaching tracks locked to prevent crowding.
Registers in perfect alignment with outside tracks.
Finish: Green Enamel.
Weight: 55 pounds.

One of the outstanding advantages of the American MonoRail System of overhead handling is the flexibility which makes possible fitting it into any plant layout.

It is sometimes necessary for two lines of MonoRail to cross at right angles. The cross track switch illustrated above provides for through travel in either direction or for shifting from one track to the other.

These cross track switches may be grouped to operate in pairs or in batteries of four for special service. By means of the cross track switch special long load bars with a trolley at each end can be switched from a straightaway line of travel in a single track to cross operation on parallel tracks.

Loaded trolleys can be run onto the cross track switches or turntables and the latter operated without changing the position of the load. The shifting or revolving section of the cross track switch is carried on roller thrust bearings and operates easily even under load. Latching with either track is positive and secure.

Trolleys cannot possibly leave the track on a cross track switch as open rail ends are automatically guarded. Smooth operation over cross track switches is secured by positive alignment between track and switch section.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

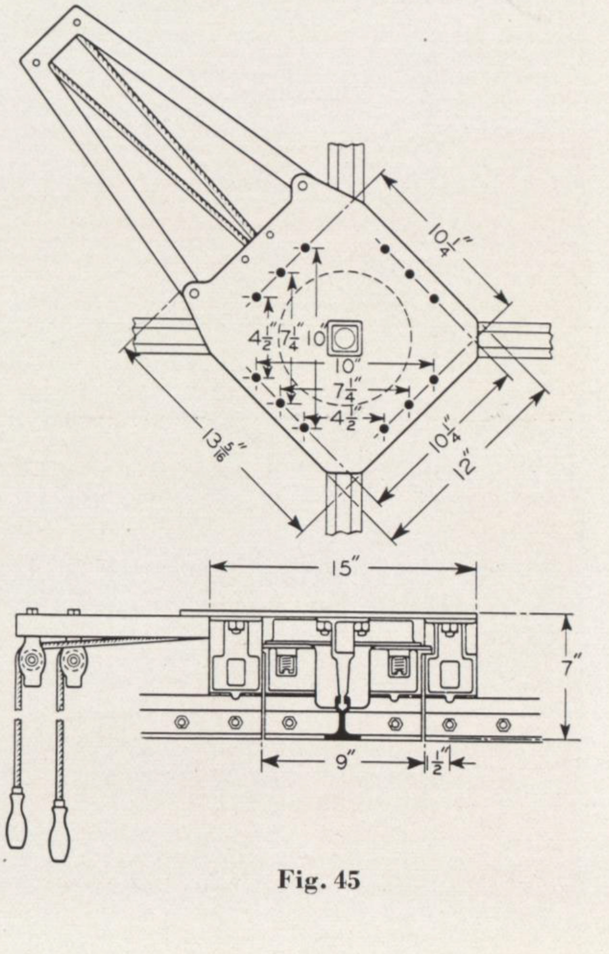


Fig. 45

Standard Turntable Dimensions

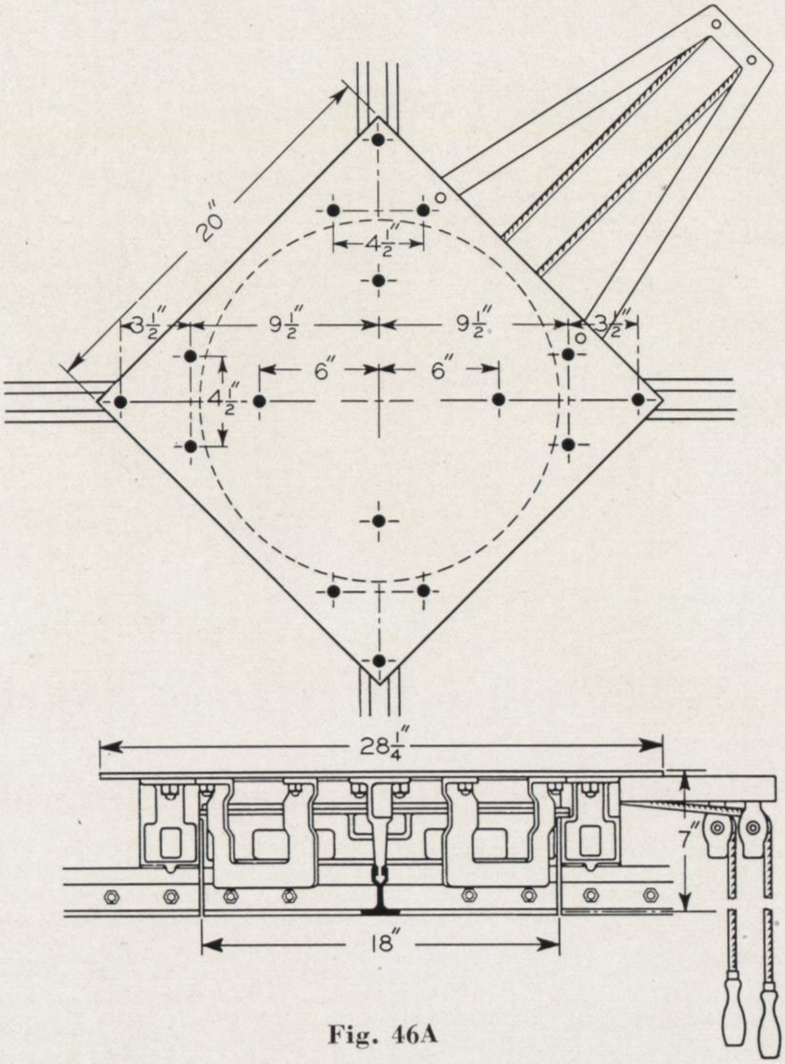


Fig. 46A

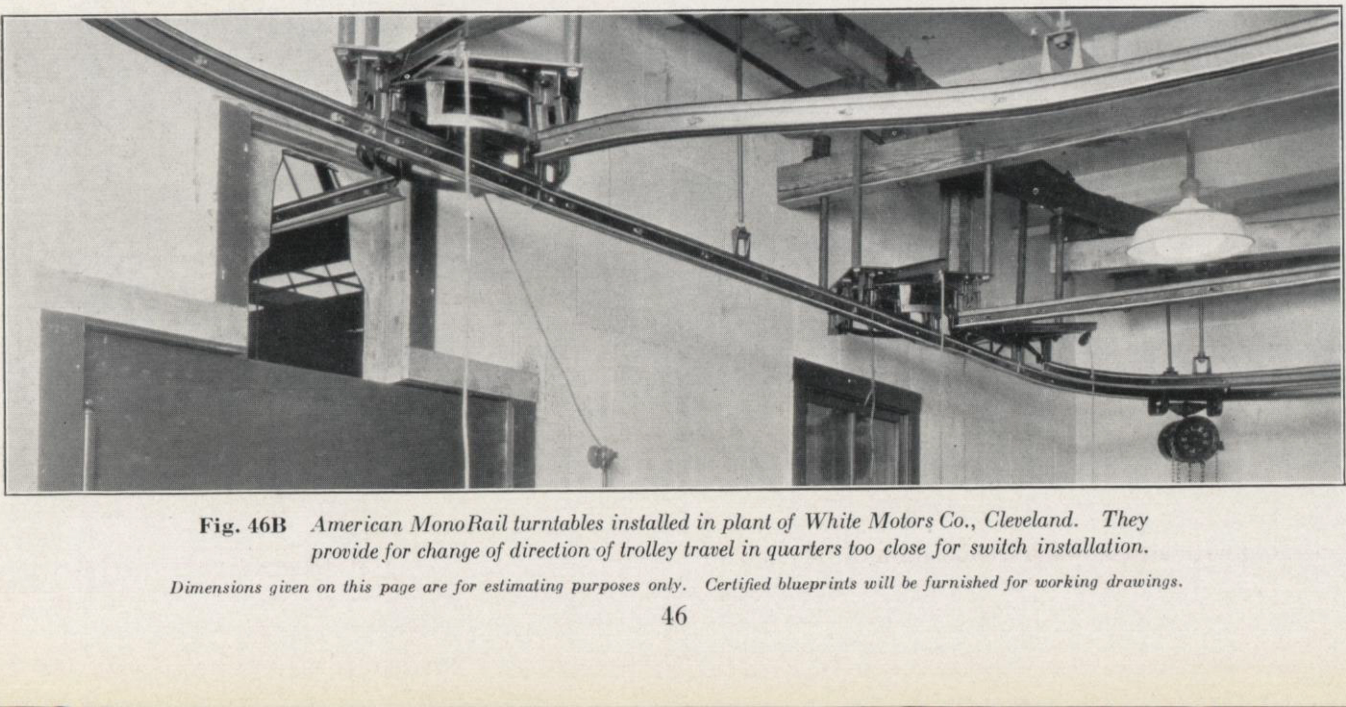
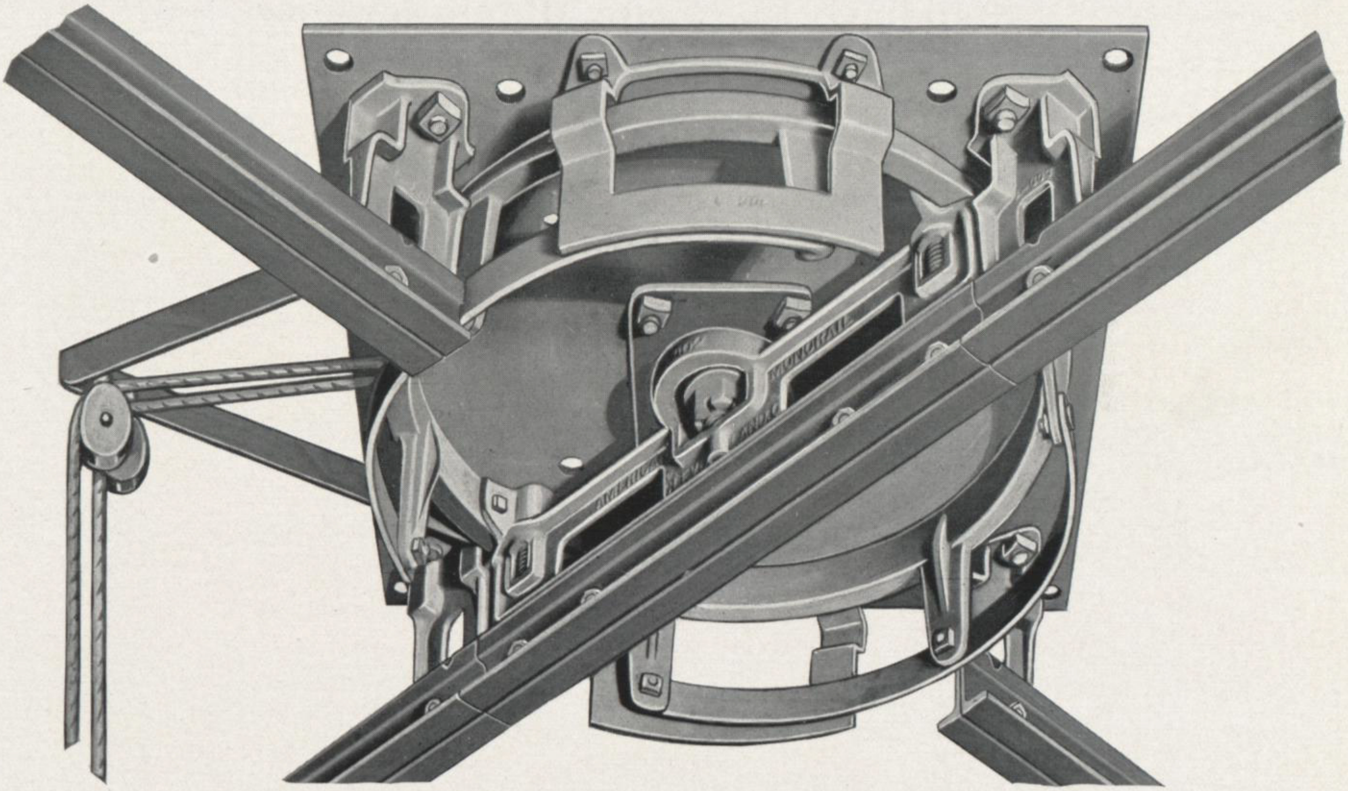


Fig. 46B *American MonoRail turntables installed in plant of White Motors Co., Cleveland. They provide for change of direction of trolley travel in quarters too close for switch installation.*

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 308 MonoRail Standard Turntable

Specifications

Size, to accommodate four-wheel trolleys Nos. 165 or 162.
Operating parts, malleable iron.
Parts mounted on $\frac{5}{16}''$ steel plate.
Swing bar carried on roller thrust bearings.
Operates easily under load.
All nuts secured with lock washers.
Pull ropes, heavy sash cord, standard length, 3 feet.
Registers in perfect alignment with outside track.
All open rail ends automatically guarded.
Approaching tracks locked to prevent crowding.
Depression in rail flange spots trolley in position.
Finish: Green Enamel.
Weight: 74 pounds.

In laying out MonoRail to fit a given situation the track itself can be formed into very short radius curves, and by incorporating switches, cross track switches, and turntables in the system it is possible to secure any desired line of travel for the trolley.

Where a direct right angle turn is desired, or where conditions are so crowded that the placing of a switch is impractical, turntables are used to secure the change in direction of travel.

The shifting or revolving member, supported on thrust roller bearings, operates easily and smoothly while carrying loaded trolley. If a swivel is provided between the trolley and load, the turntable can be operated without changing the position of the load.

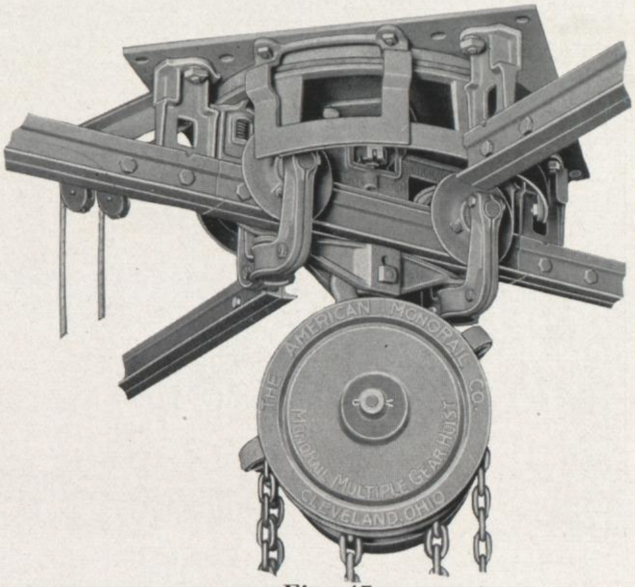


Fig. 47

MonoRail Giant Turntable Dimensions

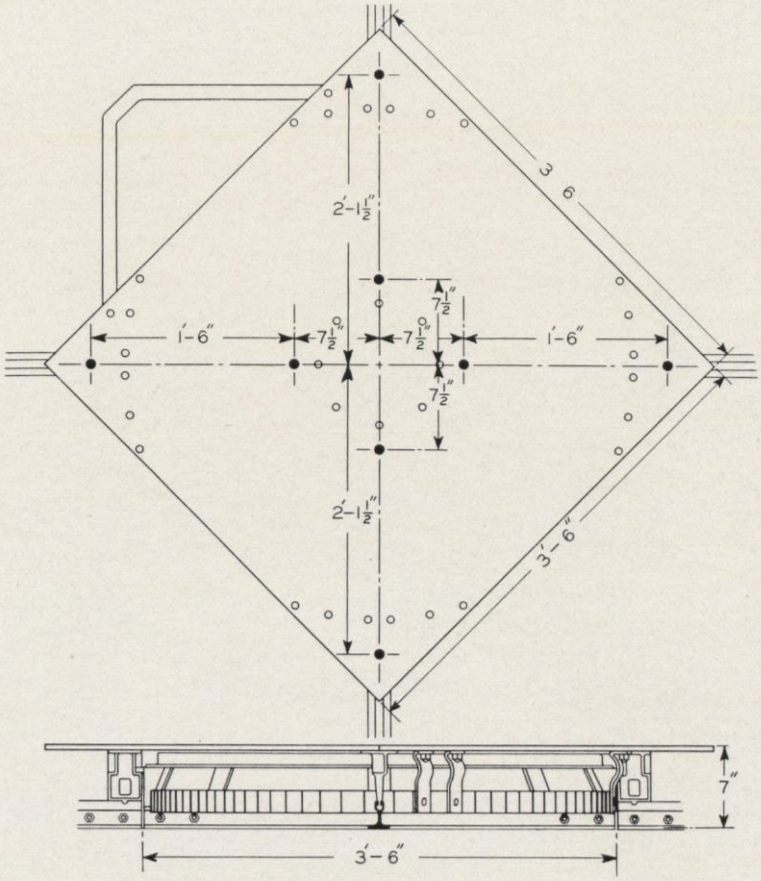


Fig. 48A

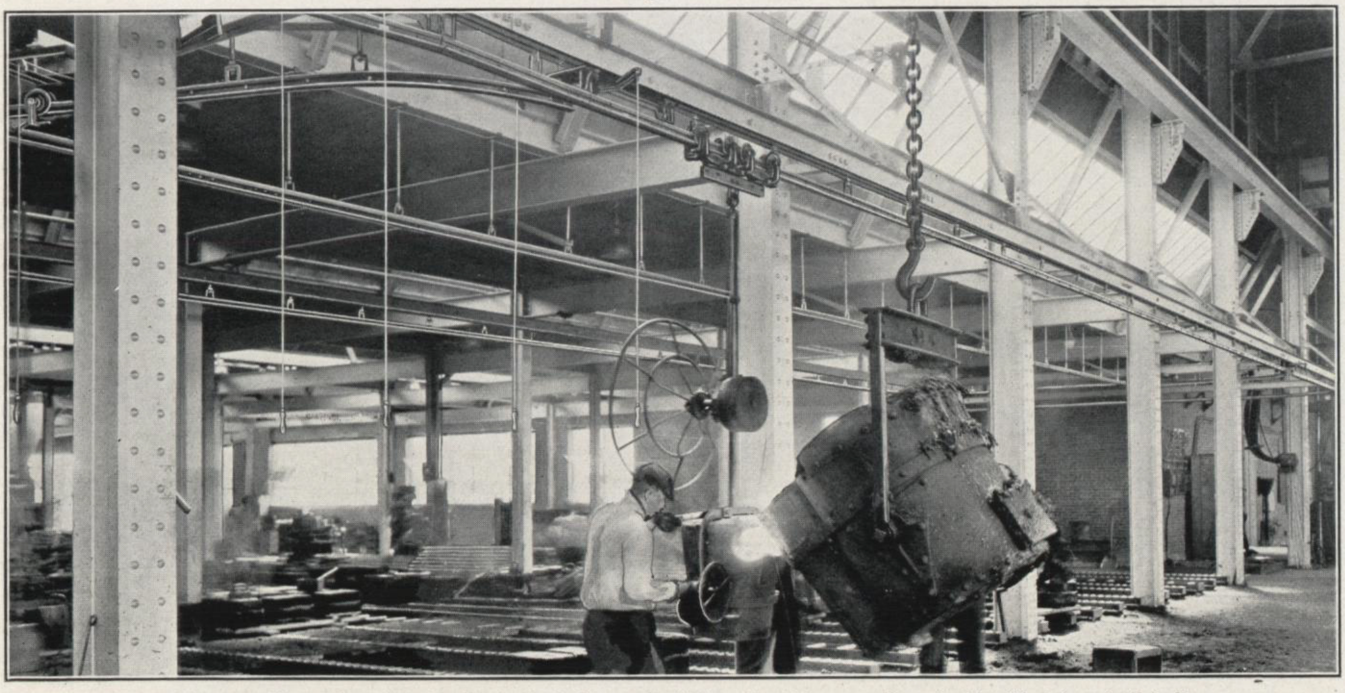
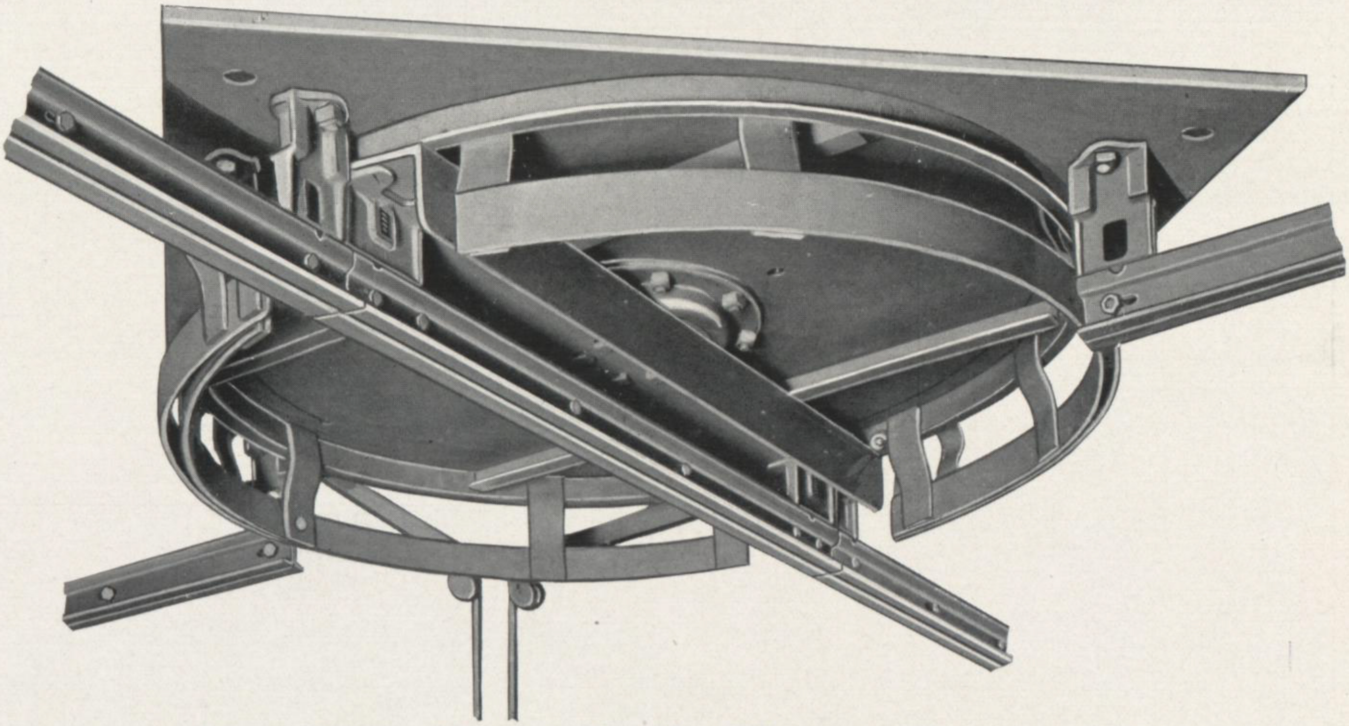


Fig. 48B *Heavy-duty installation in the Lebanon Steel Foundry, Lebanon, Pa. Ladles filled from bull ladle are carried over pouring floor by transfer cranes.*

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 389 MonoRail Giant Turntable

Specifications

Size: to accommodate eight-wheel trolleys. Nos. 175 and 171.
Capacity: one ton.
Operating parts: malleable iron.
Parts mounted on ½″ steel plate, 42″ x 42″.
All nuts secured with lock washers.
Swing bar carried on ball bearings.
Open rail ends automatically guarded.
Approaching tracks locked to prevent crowding.
Pull ropes: heavy sash cord, standard length, 3 feet.
Finish: Green Enamel.
Weight: 425 pounds.

The giant turntable is built on the same general plan as the standard turntable except that it is larger and heavier with greater load carrying capacity and is designed to handle eight-wheel trolleys, Nos. 175 or 171.

The swing bar, supported on ball bearings, makes it easy to operate the turntable under maximum capacity loads. The revolving arm registers in exact alignment with connecting tracks. The outer ends of the arm are supported on a shelf at registering points, which prevents any deflection as loaded trolleys pass onto or off turntable.

Safety guards protect open rail so that it is impossible for loaded trolleys to leave the track on a turntable. All approaching track, as well as the section of rail carried by the revolving bar, is locked by means of lugs on the supporting brackets so that shifting or crowding of the rail is impossible, and the bar is always free to revolve. A depression in flange of the rail on the turntable spots the trolley in position.

For loads exceeding one ton the MonoRail swiveling crane described on page 113, is recommended.

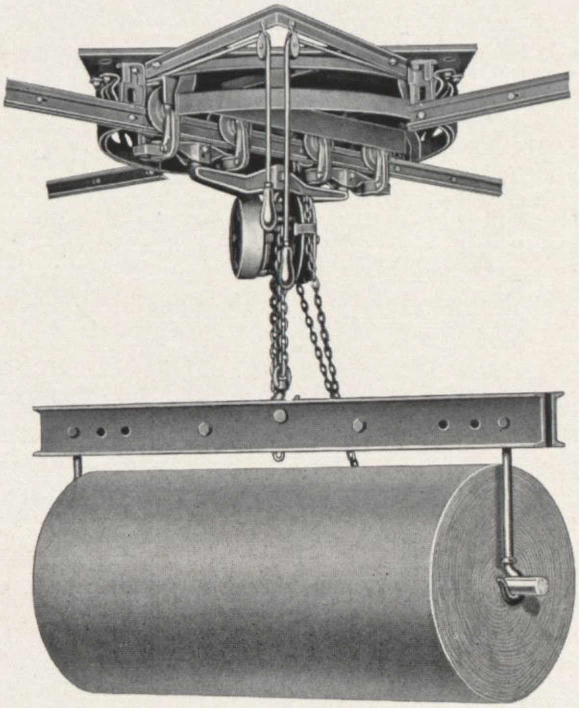


Fig. 49

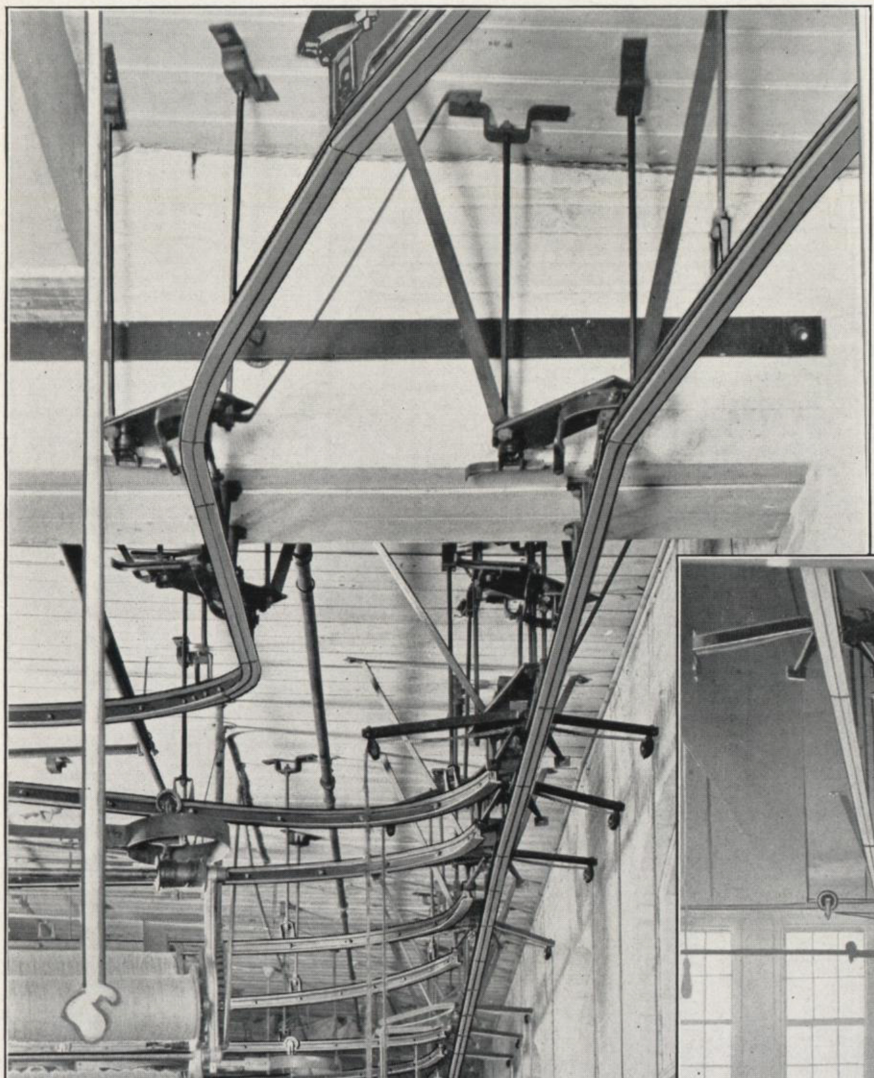


Fig. 50A

Left—*Four MonoRail Automatic Firedoor Track Openers guard this door in the plant of F. C. Huyck & Sons., Inc., Rensselaer, N. Y. Here is seen also a line of two-way tongue type switches.*

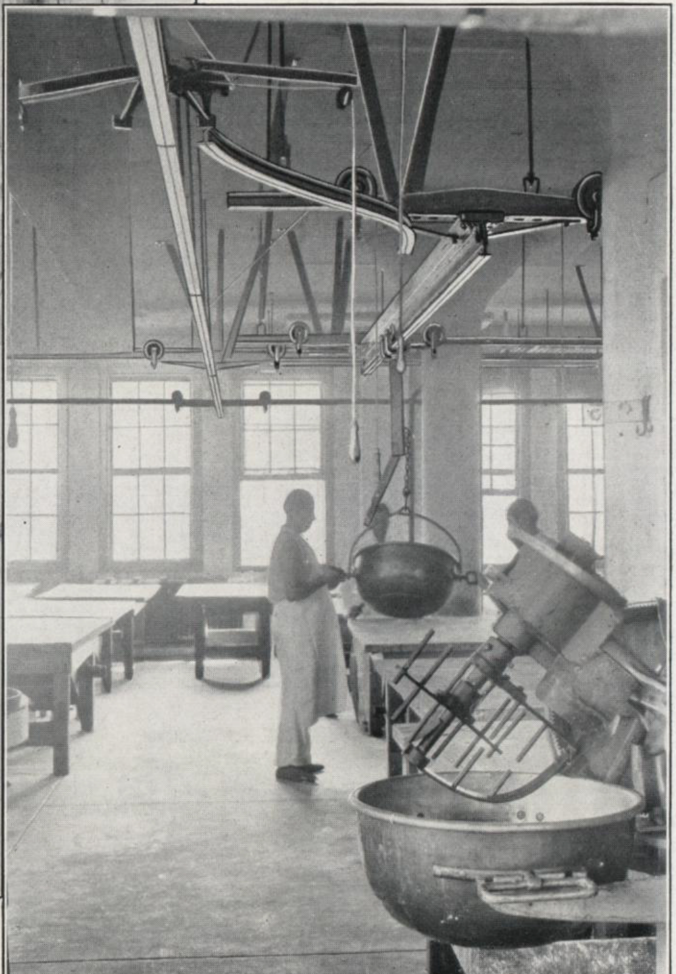
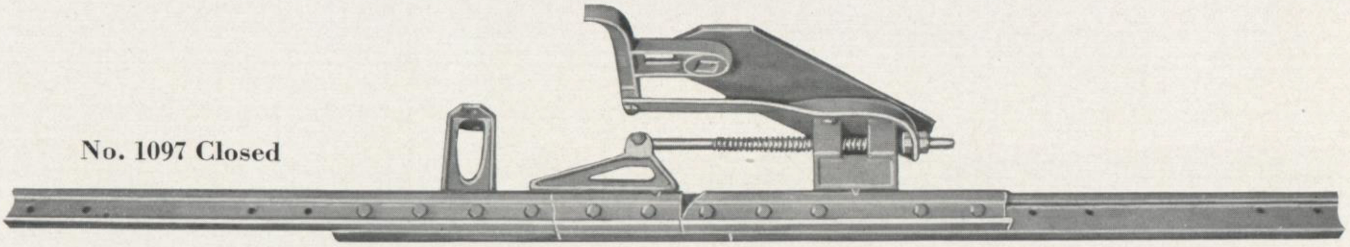
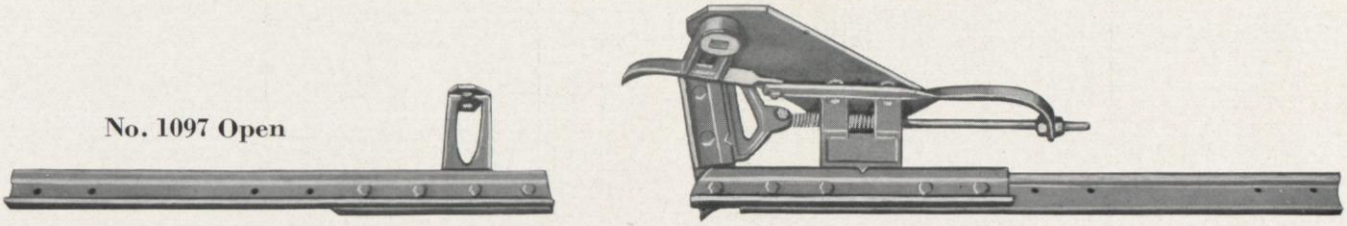


Fig. 50B

Right—*This candy manufacturer, Minter Brothers, Philadelphia, Pa., uses a MonoRail crane to handle his candy kettles to the cooling tables. There is some difference between molten metal and hot candy, but MonoRail handles both with efficiency and exactness.*



No. 1097 Closed



No. 1097 Open

MonoRail Track Opener for Fire Doors

In the extension of a MonoRail system through a factory, warehouse or stock rooms, it is frequently necessary to route the runway through doorways protected by automatically-operating fire doors.

The MonoRail Automatic Fire Door Track Opener provides a positive, never-failing means of opening the track for the passage of the fire door in case of fire. By the installation of this automatic device the fire risk is not increased by the locating of the MonoRail runway in the door opening.

In the above illustration the automatic Track Opener is shown completely assembled, in the closed and open positions. The lower illustrations show the operation of the Track Opener in use. The left hand illustration shows the fire door open for travel of trolley through the open door. As the fire door closes, it strikes the lever "A" which rotates and pushes the connecting bar "B" away from the door. The pull rod "C" raises the hinged section of track "D" and opens the way for the door to pass through.

The assembly is of malleable iron, heavy and strong, yet it operates freely and easily. The weight of even very light fire doors is sufficient to insure the opening of the track at the proper time.

Air-operated, electrically-controlled door openers may be used with this device.

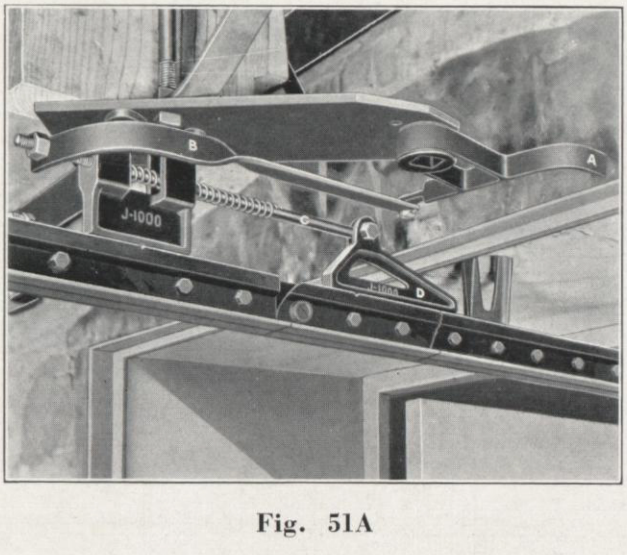


Fig. 51A

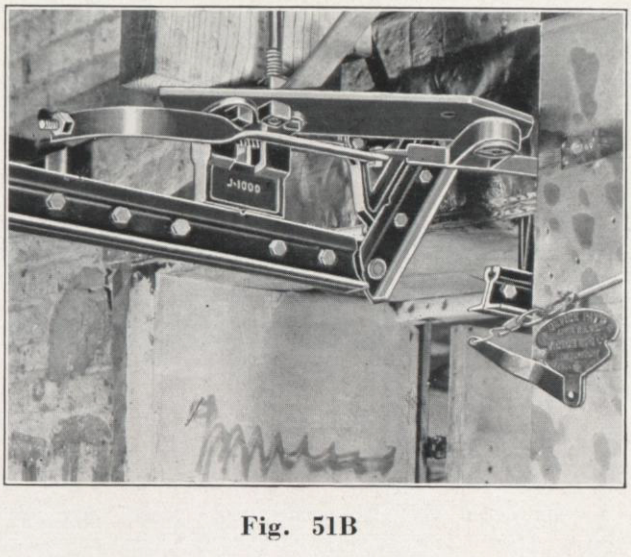


Fig. 51B

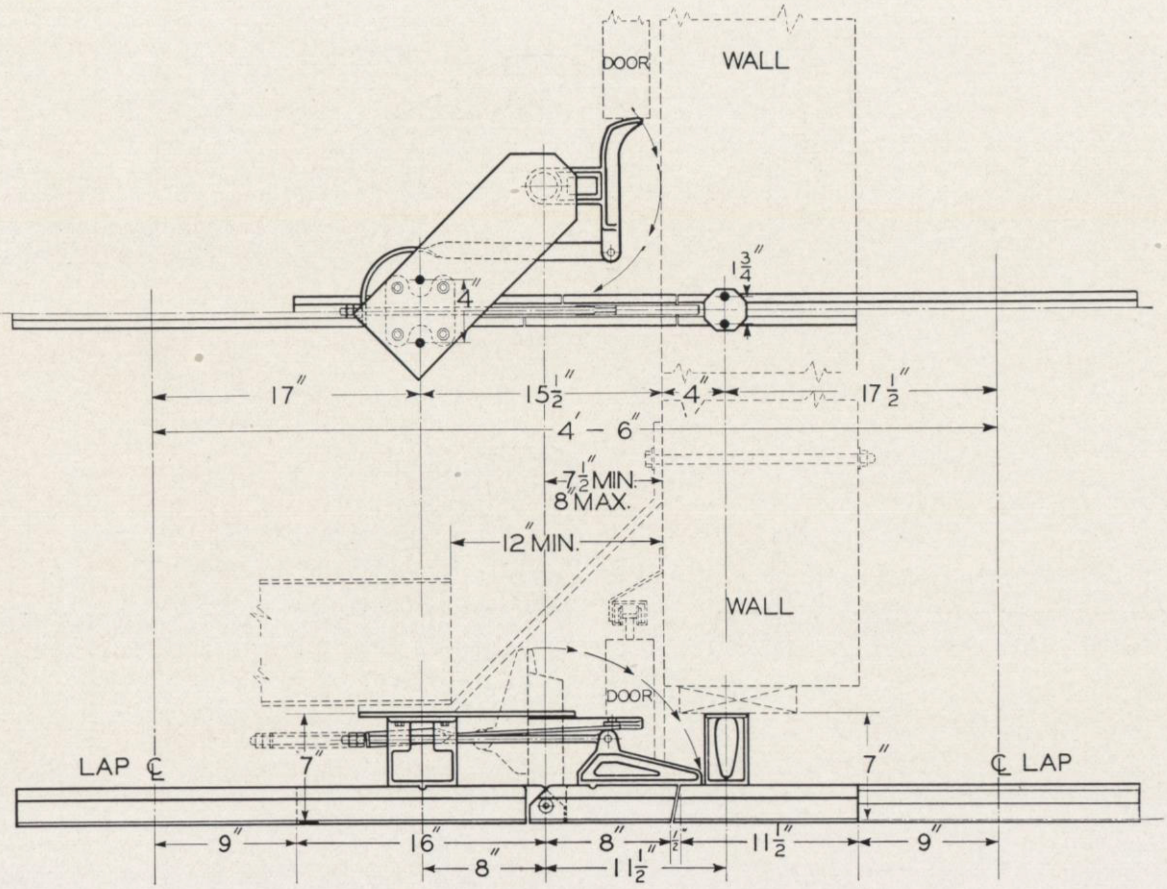
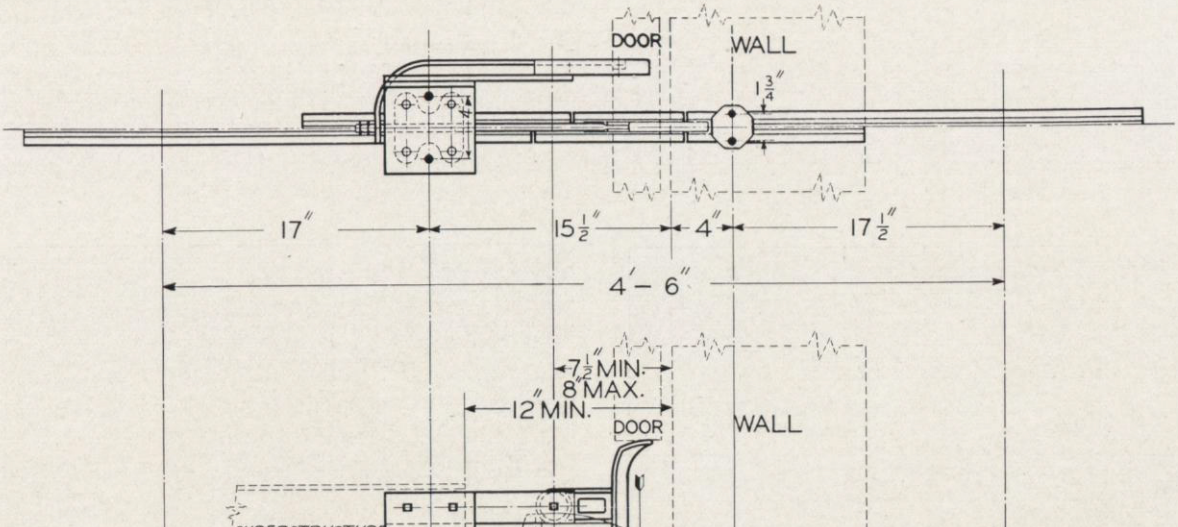


Fig. 52A Above—*Detail of Track Opener as applied to horizontally operating fire doors, and*
Fig. 52B Below—*to vertically operating doors.*



Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

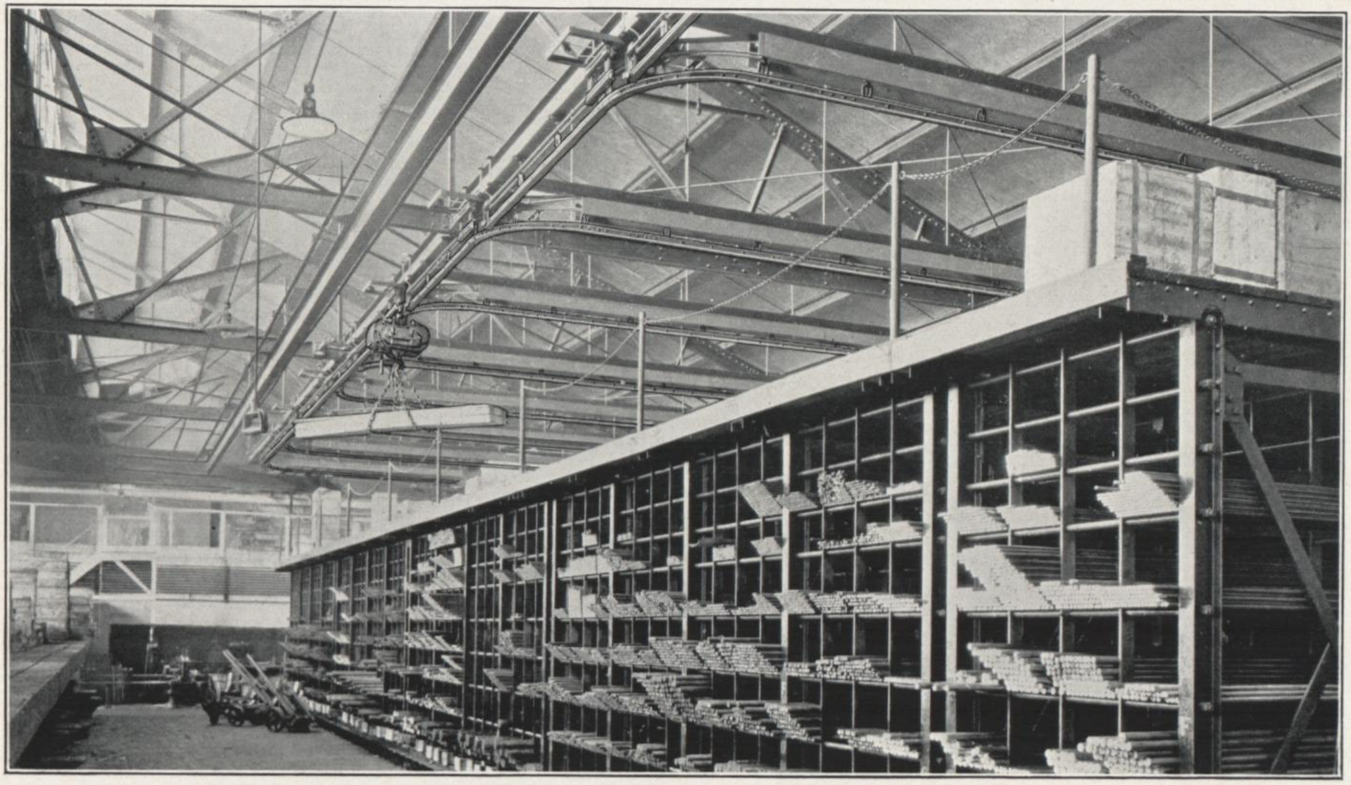


Fig. 53A *MonoRail track system leading to balcony storage in steel warehouse. Materials are handled from floor level. System is electrified for hoist operation.*

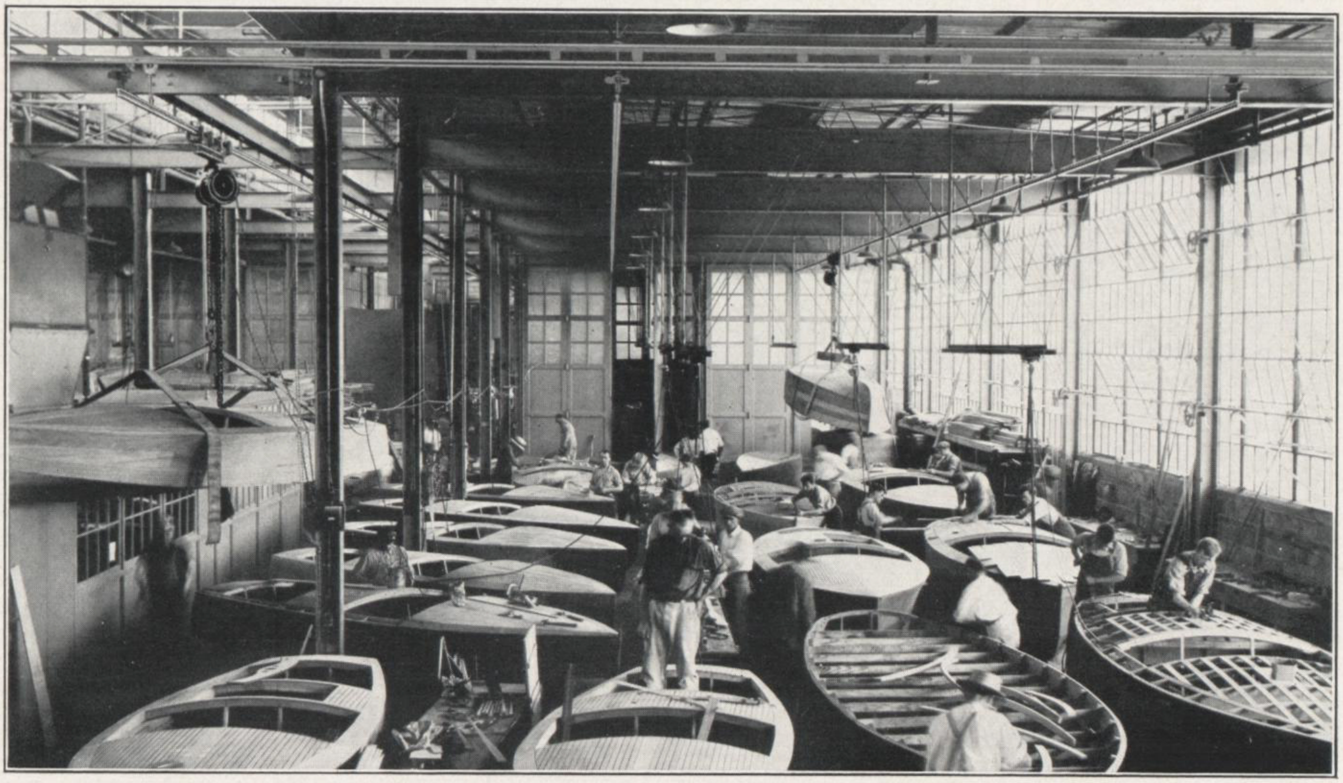


Fig 53B *MonoRail system in plant of the Horace R. Dodge Boat & Plane Corp., Newport News, Va., handling boats through production operations to launching into the water.*

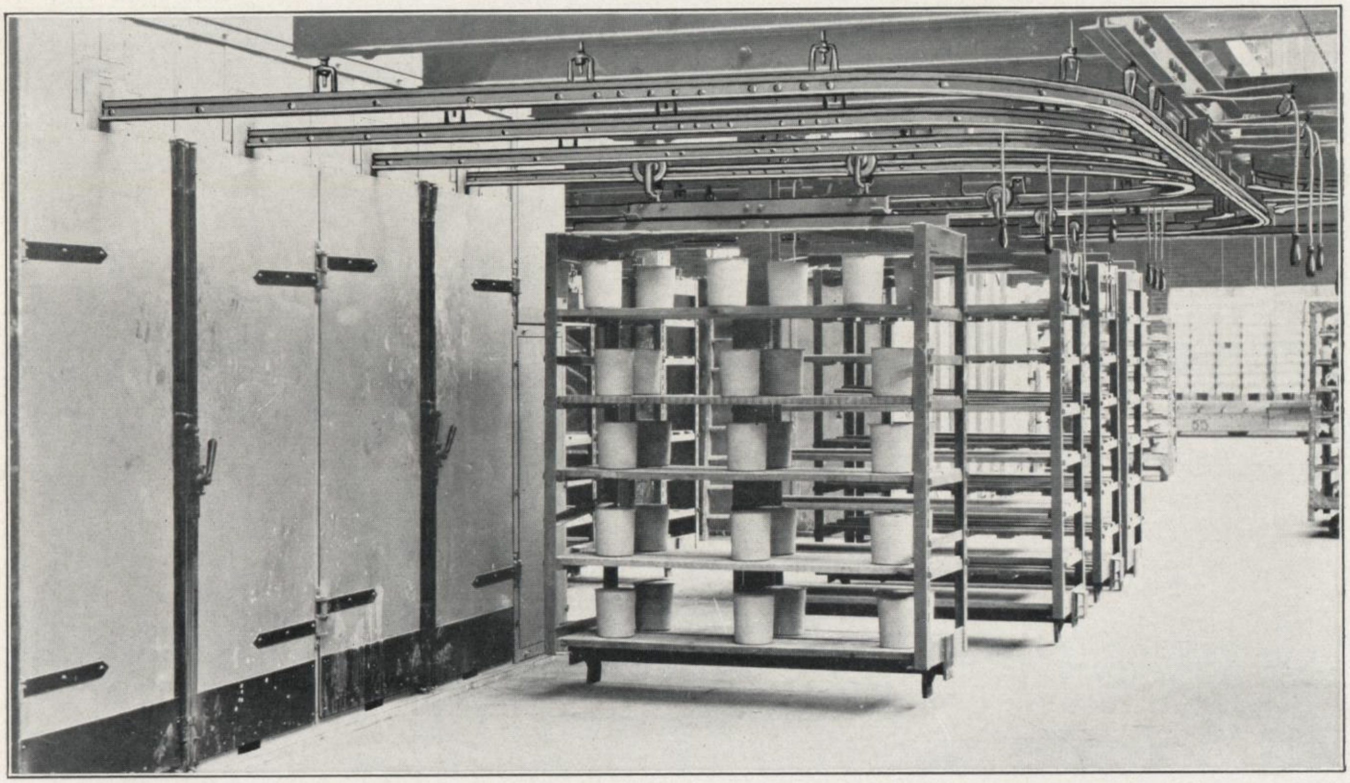


Fig. 54A *Door closures on dryers in Locke Insulator plant, Baltimore, Md. Note also line of glide type switches serving closely spaced tracks leading into dryer.*

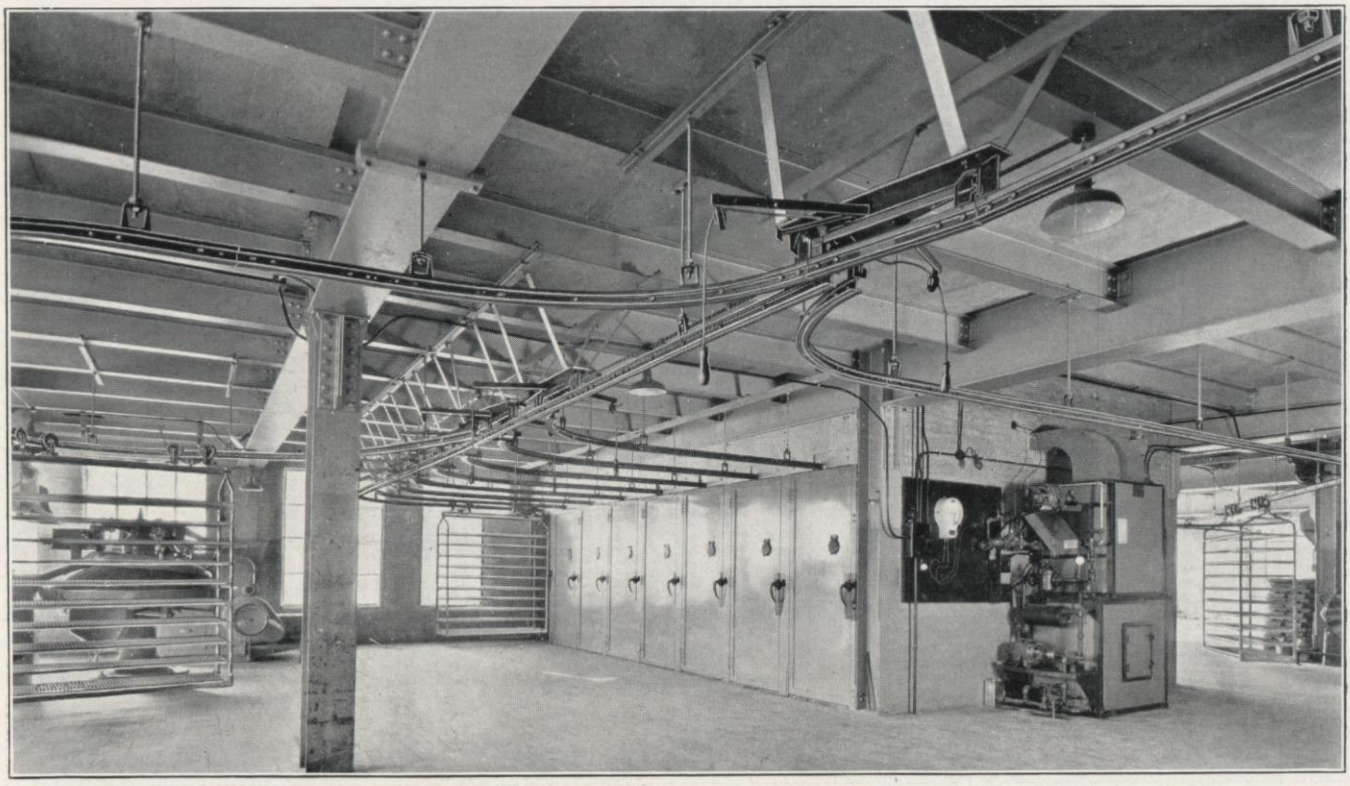


Fig. 54B *Oven doors in the plant of the Twentieth Century Bakery, Haverhill, Mass., are provided with door closures fitting around MonoRail tracks over which racks are handled into ovens.*

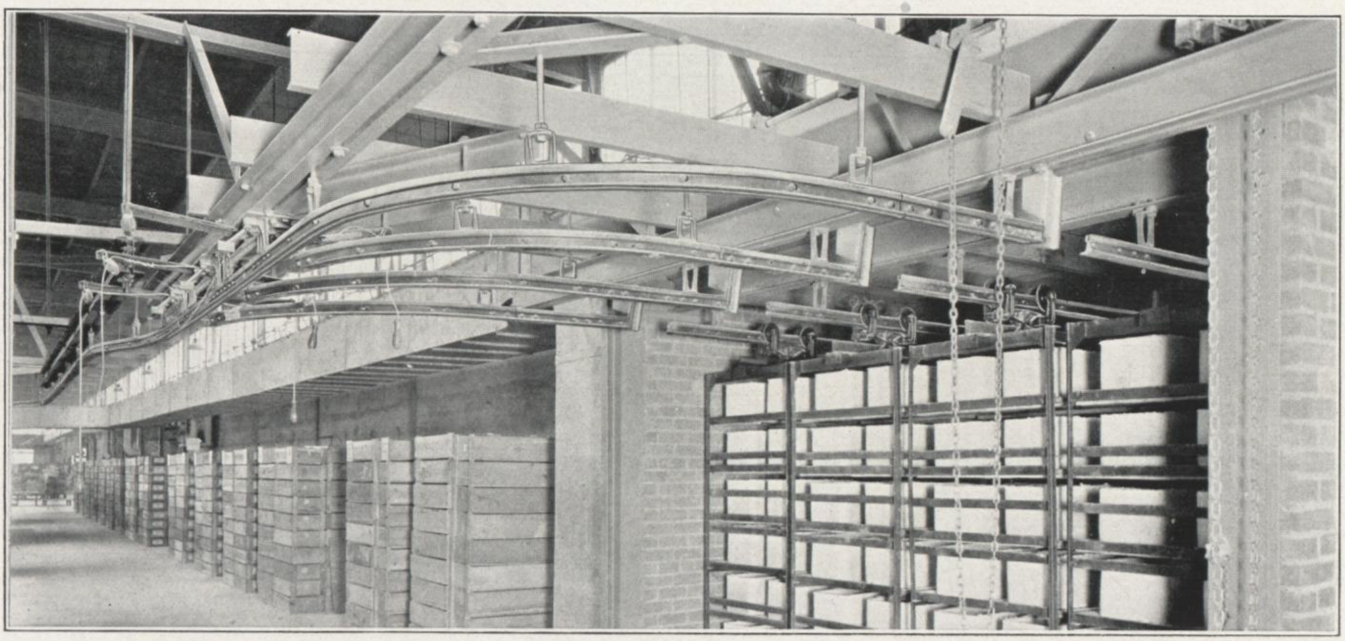


Fig. 55A *Track-opening device in MonoRail system in ceramics plant. Permits lowering of curtain doors after ovens have been filled with racks of ware carried on MonoRail trolleys.*

MonoRail Door Closures for Ovens, Kilns, Lehrs

American MonoRail overhead conveying systems are frequently called upon for the handling of material into and through drying, baking, annealing, refrigerating and similar processes.

Provision must be made in such installations for closures that will permit the passing of loaded trolleys, yet will prevent the escape of heat from ovens or kilns, or the raising of temperature in ice boxes or refrigeration rooms.

MonoRail engineers have solved these problems in a variety of installations. Illustrations on this page show typical closures that have given satisfactory results in service.

On page 172 will be found detail drawings of door closures that are applicable to a great number of situations calling for a temperature seal in ovens, dryers, proof rooms, kilns, lehrs, as well as low temperature rooms.

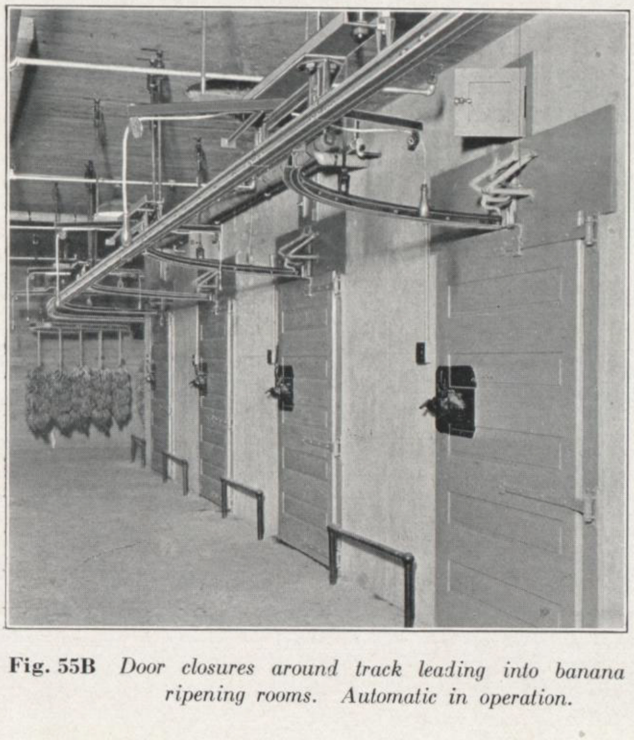


Fig. 55B *Door closures around track leading into banana ripening rooms. Automatic in operation.*

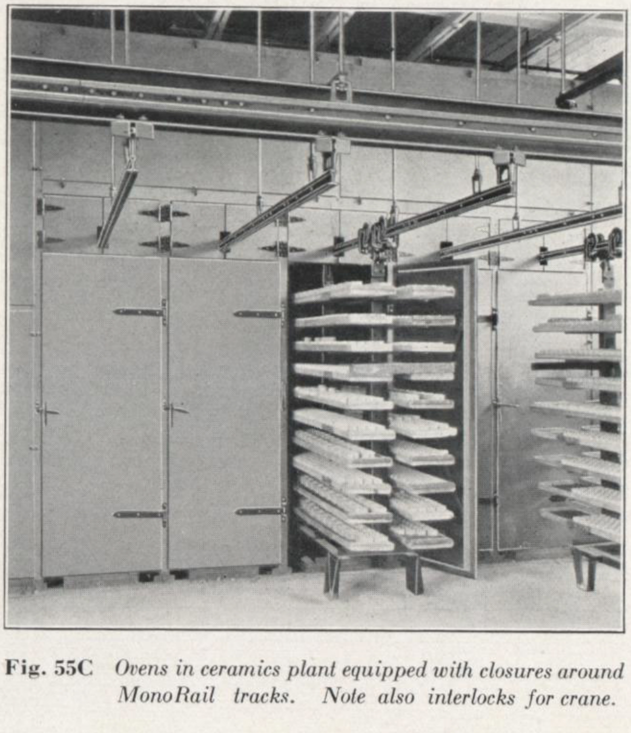


Fig. 55C *Ovens in ceramics plant equipped with closures around MonoRail tracks. Note also interlocks for crane.*

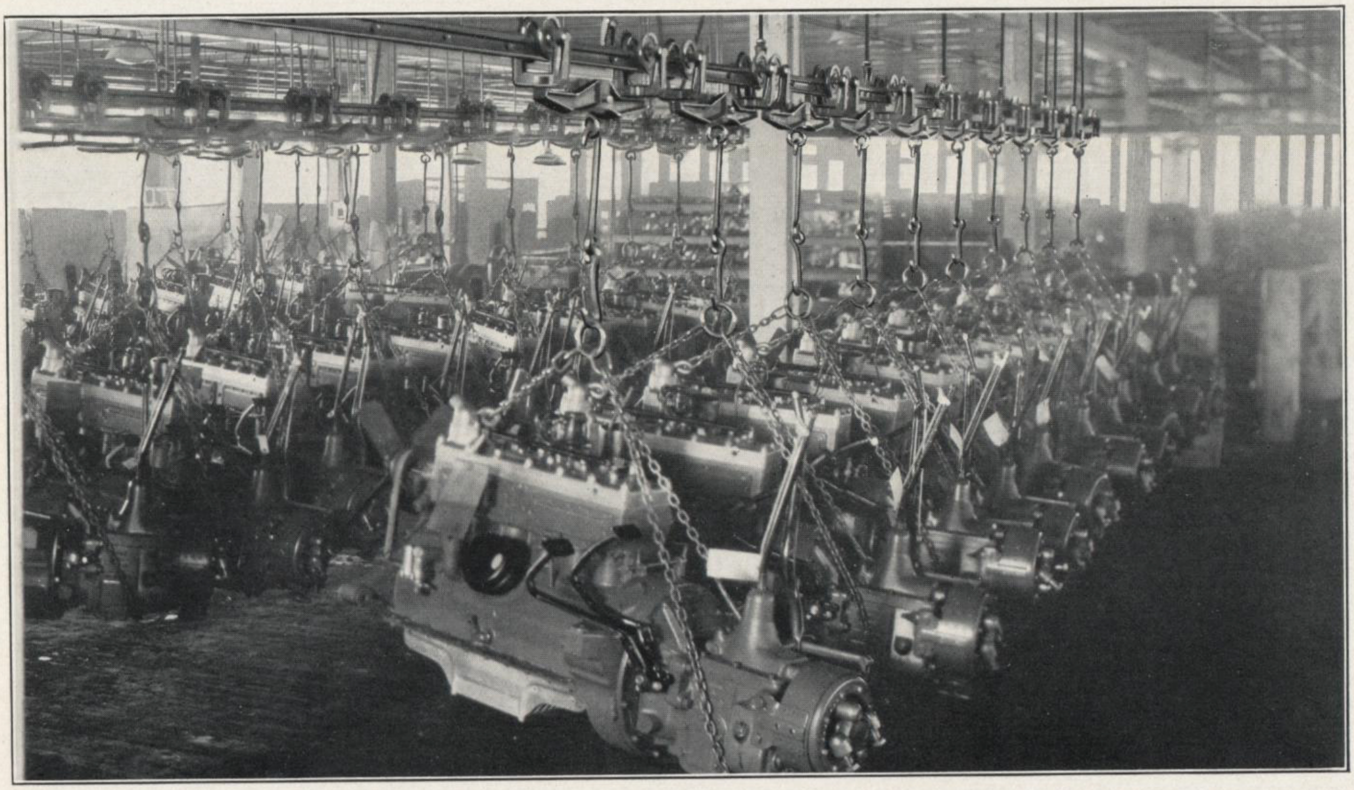


Fig. 56 *American MonoRail Trolleys in Heavy, Continuous Service in plant of Automotive Manufacturer.*

American MonoRail - *The Trolley*

The successful operation of an overhead mechanical handling system of the MonoRail type depends largely on the parts that move. So, in designing American MonoRail Trolleys the important factors of Strength, and Ease of Propelment were given first consideration.

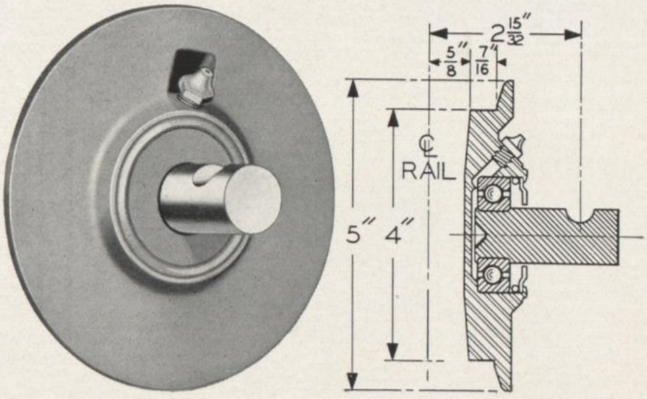
The Wheels

To provide adequate strength the wheels on all MonoRail Trolleys are drop forgings. They will stand up for years under the heaviest and severest kind of service.

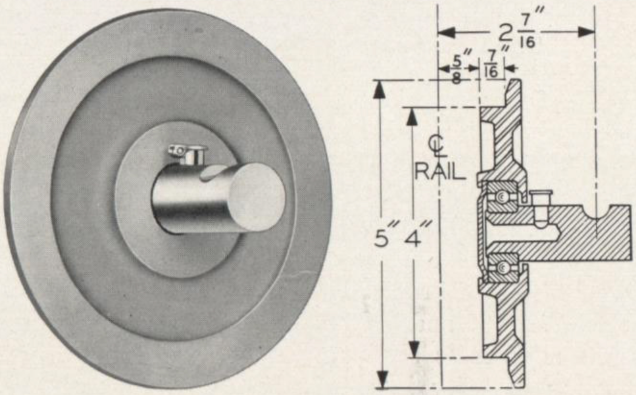
To insure ease of propelment, combined with the longest possible trouble-free life in service, MonoRail Trolley wheels are mounted on New Departure precision ball bearings of the highest grade automobile type, carried on steel axles. In this we have combined with our experience that of a specialist in the production of anti-friction bearings of definite

Index-Schedule Showing Catalog Numbers, Capacities, and Over-all Length of Standard American MonoRail Trolleys.

2-Wheel Trolleys		4-Wheel Trolleys			8-Wheel Trolleys		
Catalog Number	Capacity	Catalog Number	Capacity	Over All Length	Catalog Number	Capacity	Over All Length
150	500 lb.	165	1,000 lb.	17″	175	2,000	42″
157	750 lb.	162	1,500 lb.	17″	171	3,000	42″
179	1,000 lb.	180	2,000 lb.	21″	181	4,000	51″
188	250 lb.	189	500 lb.	12″			



No. 164 *MonoRail Trolley Wheel, with drawing showing dimensions.*



No. 191 *MonoRail Trolley Wheel, with drawing showing dimensions.*

capacity and guaranteed long life. Bearings are seated with a press fit into a recess in wheel with close tolerances, and retained by steel washers rolled in. This insures perfect alignment. The tread of the wheel forging is machined for proper bearing on rail flange, and to insure concentricity with the bearings.

Lubrication of No. 164 wheels is secured by the Zerk-Alemite system in connection with a Zerk-Alemite grease gun. No. 191 wheels are oiled through the center of the axle, fitted with oil cups with self-closing covers. An ordinary oil can serves the No. 191 wheel.

The ball-bearing assembly in both the No. 164 and No. 191 wheels is dust proof and practically oil-tight. The bearings are not affected by ordinary high temperatures nor extremely dusty conditions. Lubrication of these bearings is required only at infrequent intervals.

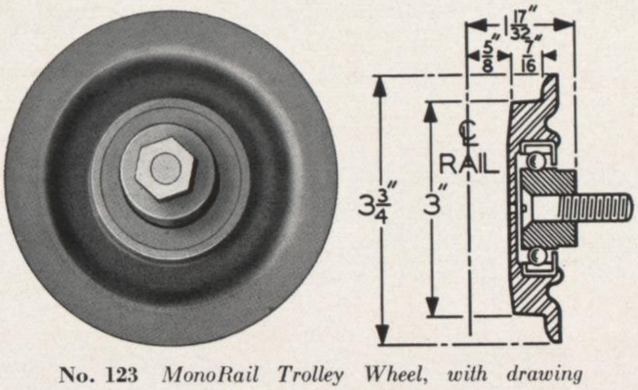
MonoRail Trolley Wheels No. 152 and No. 192 are equipped with oil-seal bearings which completely do away with the necessity of lubrication. For further description, with details of their application to MonoRail Trolleys, see pages 75 and 76.

Other Advantages

MonoRail Trolleys are equipped with bumpers so that two or more of them may be pushed along the track, one against the other, without the wheels binding.

Swivel joints are carefully fitted and trolleys operate easily and smoothly around curves, with the least possible amount of friction.

Trolley wheels cannot, by any possibility, strike or rub against MonoRail hangers, even on the shortest radius curves.



No. 123 *MonoRail Trolley Wheel, with drawing showing dimensions.*

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

The Wheel Yoke or Frame

The frame or yoke of American MonoRail trolleys was designed with the same regard for strength and lasting quality as was the wheel. The wheel yoke used on trolleys Nos. 150, 165, 170, 157, 162 and 171, is a heavy drop forging in which the axle is clamped, holding the wheel in rigid adjustment in relation to the rail. The wheel yoke used on trolleys Nos. 179, 180 and 181 is also a heavy drop forging, of tubular cross section, furnishing maximum load bearing capacity in extremely heavy duty service. Machine bolts are used throughout for assembly.

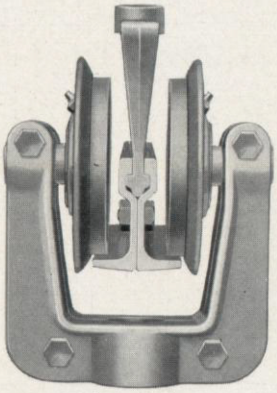


Fig. 58A

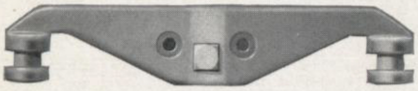
The Headroom-Saving Load Bar

The load bar designed for use in American MonoRail Trolleys presents improved and patented features of great value.

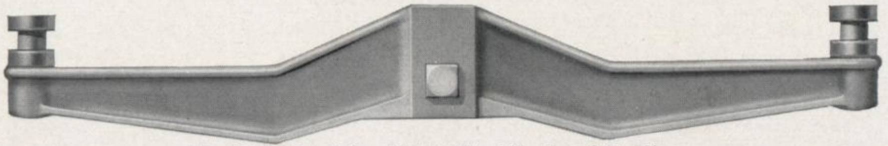
The load bar on four-wheel trolleys shown below at left is a drop forging, thoroughly tested for strength and security, and is assembled and carried on top of the supporting trolley frame instead of being suspended from underneath. This assembly brings the load bar up close to the track and adds another factor of safety. Load bars of eight-wheel trolleys, shown below at right, are alloy steel castings, designed for maximum carrying capacity.

The MonoRail load bar is provided with an internal bearing for chain hoist hooks, and carries the hoist close up to the track, conserving every possible inch of head room.

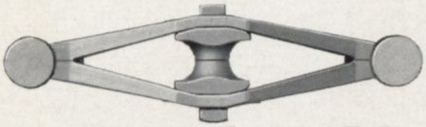
Load bars will be fitted with other types of load supporting members as shown under the descriptions of the trolleys on the following pages.



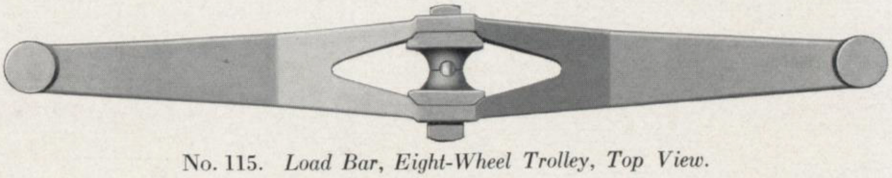
No. 167. *Load Bar, Four-Wheel Trolley, Side View.*



No. 115. *Load Bar, Eight-Wheel Trolley, Side View.*



No. 167. *Load Bar, Four-Wheel Trolley, Top View.*



No. 115. *Load Bar, Eight-Wheel Trolley, Top View.*

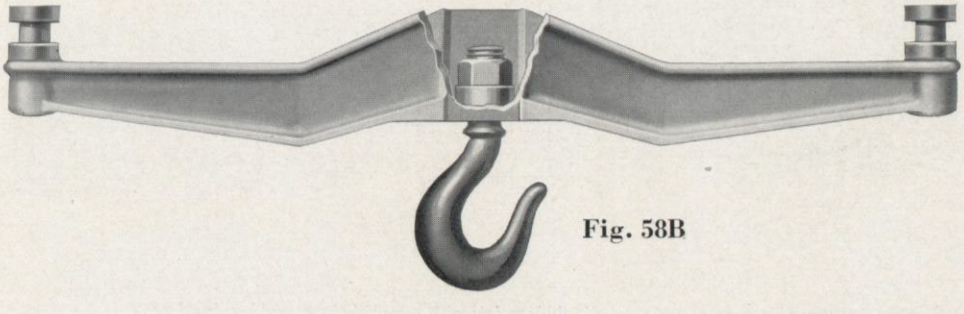
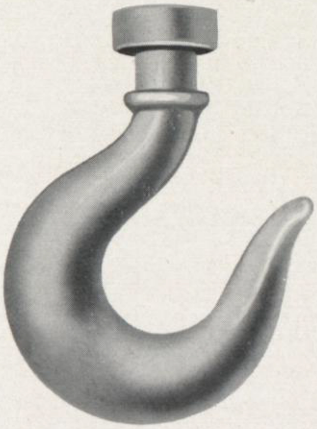


Fig. 58B

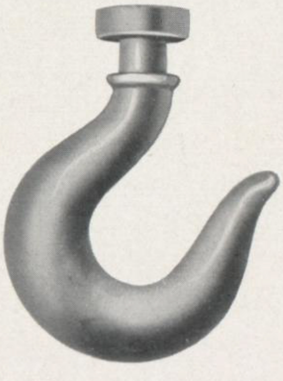
A special load bar with the hook carried on a Timken Roller Thrust Bearing, for use in cases where heavy loads are carried and the hook must be turned or swiveled constantly, has been designed to eliminate possible wear. May be applied to either four or eight-wheel trolley load bars.

Trolley Load Suspension

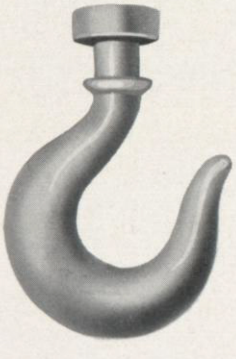
American MonoRail trolleys will be furnished, when so ordered, with a load hook, eye, swivel clevis, flat forged swivel or flanged swivel, as shown by diagrams on following pages illustrating each type of trolley.



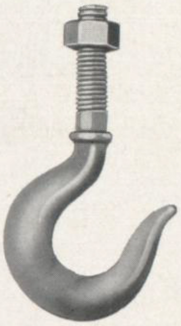
No. 103
Trolley Load Hook.
Two-ton Capacity.
Weight, 2 lb. 13 oz.



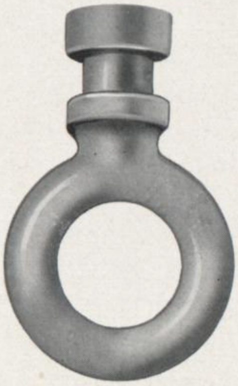
No. 158
Trolley Load Hook.
One-ton Capacity.
Weight, 1 lb. 14 oz.



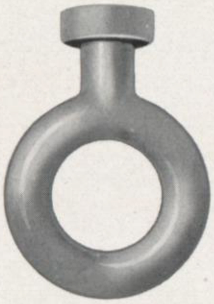
No. 160.
Trolley Load Hook.
Half-ton Capacity.
Weight, 1 lb. 8 oz.



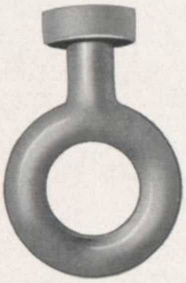
No. 120.
Trolley Load Hook.
For Light Duty.
Weight, 8 oz.



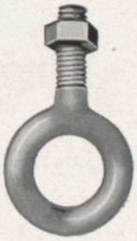
No. 104.
Trolley Load Eye.
Two-ton Capacity.
Weight, 2 lb. 6 oz.



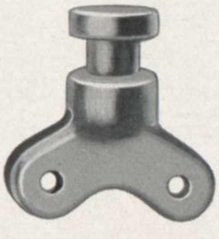
No. 159.
Trolley Load Eye.
One-ton Capacity.
Weight, 1 lb. 6 oz.



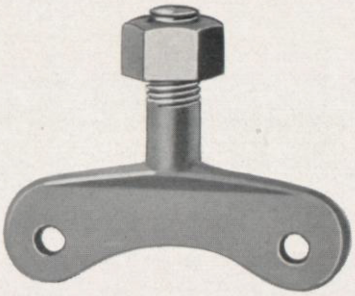
No. 173.
Trolley Load Eye.
Half-ton Capacity
Weight, 1 lb.



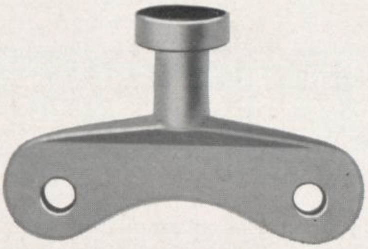
No. 121.
Trolley Load Eye.
For Light Duty.
Weight, 6 oz.



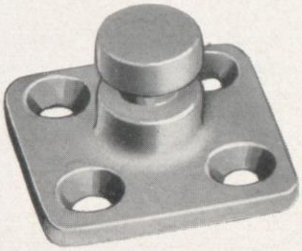
No. 106.
Trolley Swivel Clevis.
Weight, 1 lb. 2 oz.



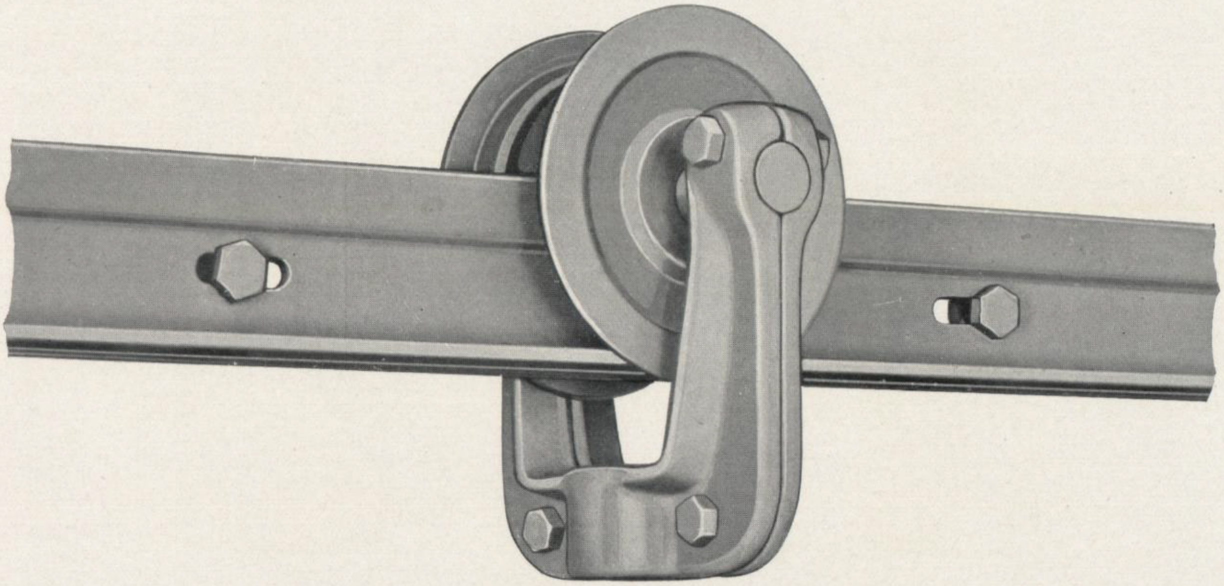
No. 144.
Flat Forged Swivel.
Weight, 1 lb. 8 oz.



No. 177.
Flat Forged Swivel.
Weight, 1 lb. 8 oz.



No. 119.
Flanged Swivel.
Weight, 1 lb. 8 oz.



No. 150 Two-Wheel Trolley

Capacity, 500 Pounds

Specifications

Capacity: 500 pounds.
Wheels: Drop forgings, No. 191.
Wheel Yoke: Drop forging.
Wheel Bearings: New Departure single row precision ball.
Axles: Machined steel.
Lubrication: Special hollow axle, self-closing oil cup.
Finish: Green Enamel.
Weight: 8¾ pounds.

American MonoRail Two-Wheel Trolley No. 150, illustrated above is an all-steel trolley unit of design, material, and construction consistently followed out through the whole line of MonoRail trolleys.

This trolley is used generally for carrying racks or bars, where the trolleys are used in pairs. It is also used in the heavier type of power-operated chain-propelled installations.

The two-wheel trolley is priced without load supporting member, but can be furnished with any one of the fittings—load hook, eye, clevises, or flange swivel illustrated below for the additional cost of the fitting. These drawings also give all dimensions and clearances.

The oil-seal bearing may be applied to the wheels of this trolley where freedom from the necessity of lubrication is a considerable advantage or where a perfectly oil tight bearing is required. See No. 1502, page 75.

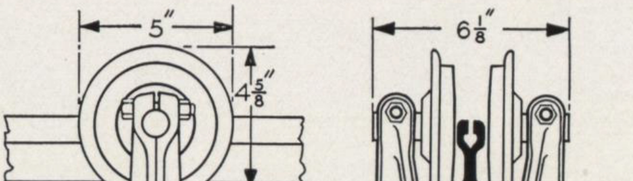


Fig. 60A

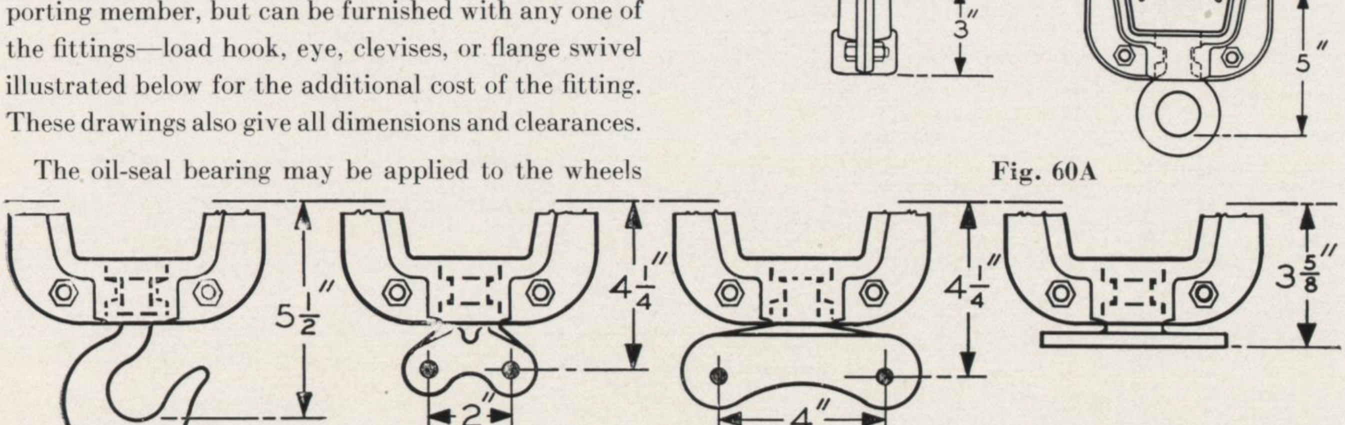
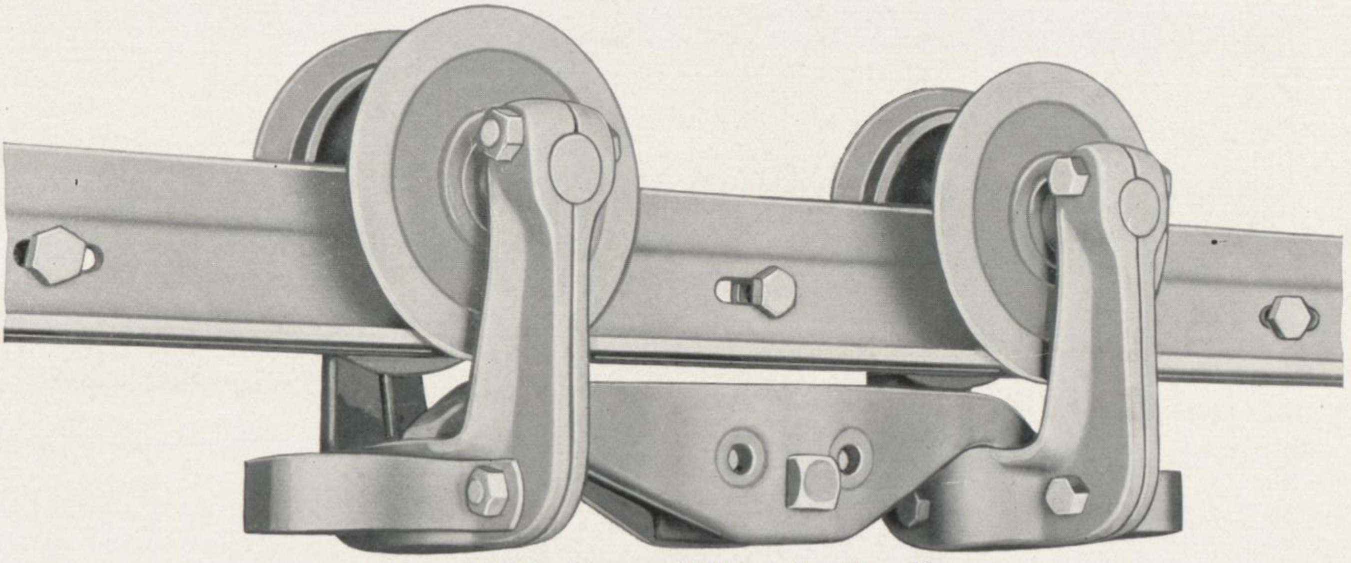


Fig. 60B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 165 Four-Wheel Trolley

Capacity, 1000 pounds

Specifications

Capacity: 1000 pounds.
Wheels: Drop forgings, No. 191.
Wheel Yokes: Drop forgings.
Wheel Bearings: Single row New Departure precision ball.
Axles: Machined steel.
Lubrication: Through axles with self-closing oil hole cover.
Load Bar: Drop forging.
Load Bars: Furnished regularly with improved internal hoist hook bearing.
Load Bar: Will be furnished with any one of the fittings shown below—load hook, eye, or clevises when so ordered, without additional charge.
Finish: Green Enamel.
Weight: 24 pounds.

The American MonoRail four-wheel trolley No. 165 is made up of two-wheel trolleys No. 150 coupled by the drop forged load bar.

The load bar is assembled on top of the drop forged trolley yoke which brings it up close to the rail providing a maximum saving in headroom.

An internal hoist hook bearing is regular equipment on the load bar of this trolley, but any one of the load suspension items shown below will be furnished when specified by the buyer at no additional cost.

All American MonoRail trolleys are of neat, symmetrical design. They require a minimum effort to overcome standing inertia and to keep under motion when started. They travel smoothly over track and switches and around curves as short as 12″ radius, when either loaded or empty.

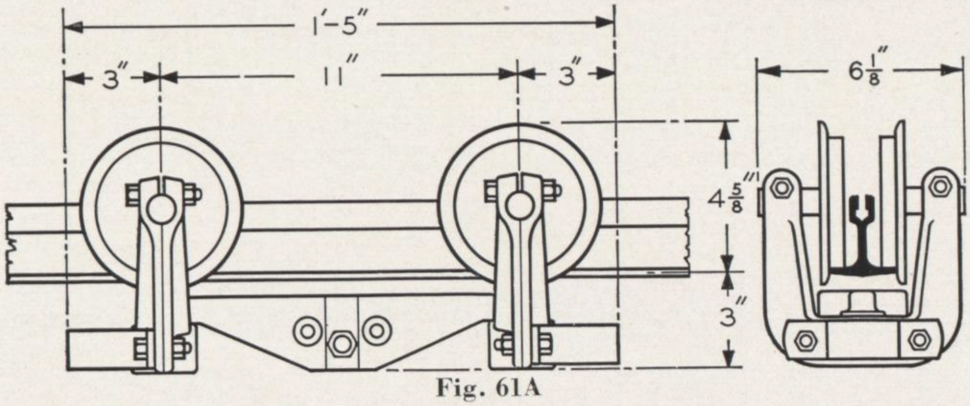


Fig. 61A

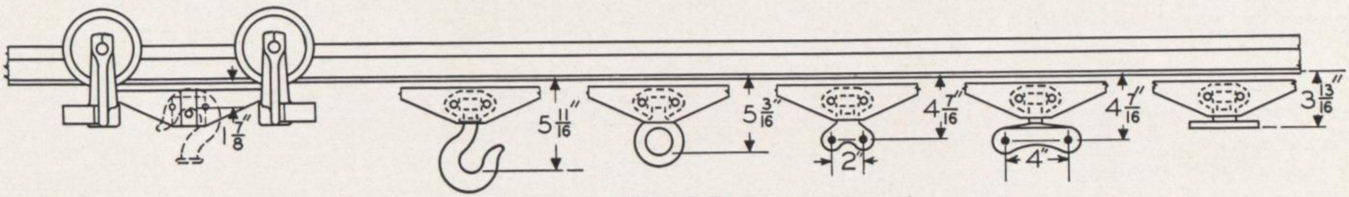


Fig. 61B

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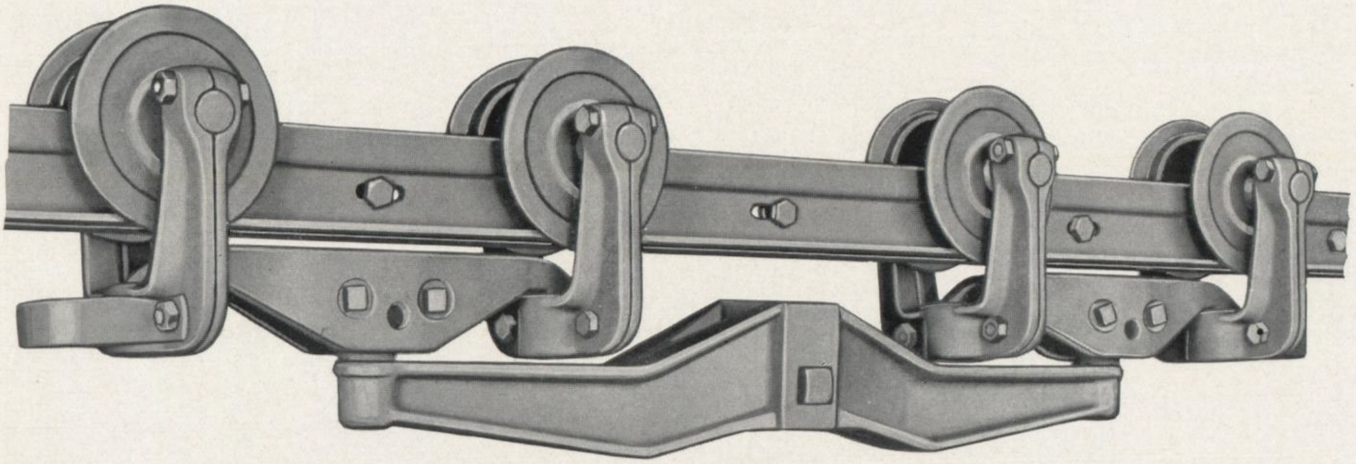


No. 175 Eight-Wheel Trolley

Capacity, 2000 pounds

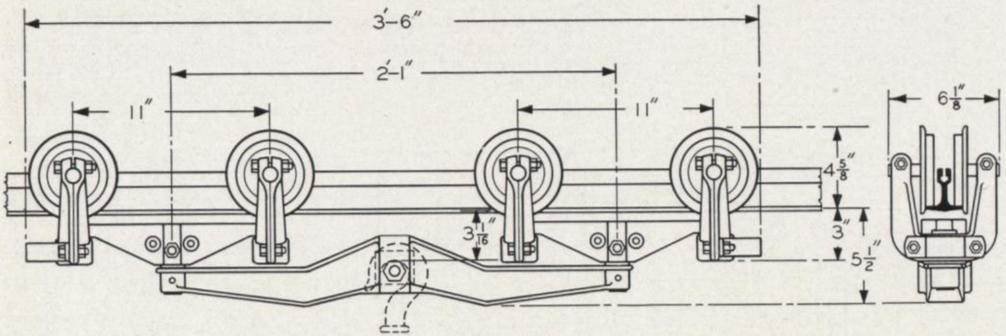
Specifications

Capacity: 2000 pounds.
Wheels: Drop forgings, No. 191.
Wheel Yokes: Drop forgings.
Wheel Bearings: New Departure single row precision ball.
Axles: Machined steel.
Lubrication: Through axle with self-closing oil hole cover.
Load Bar: Alloy steel casting with end swivels of turned nickel steel.
Load Bars: Furnished regularly with improved internal hoist hook bearing.
Load Bar: Will be furnished with any one of the fittings—load hook, eye or clevises illustrated below at no additional cost when so ordered.
Finish: Green Enamel.
Weight: 67 pounds.

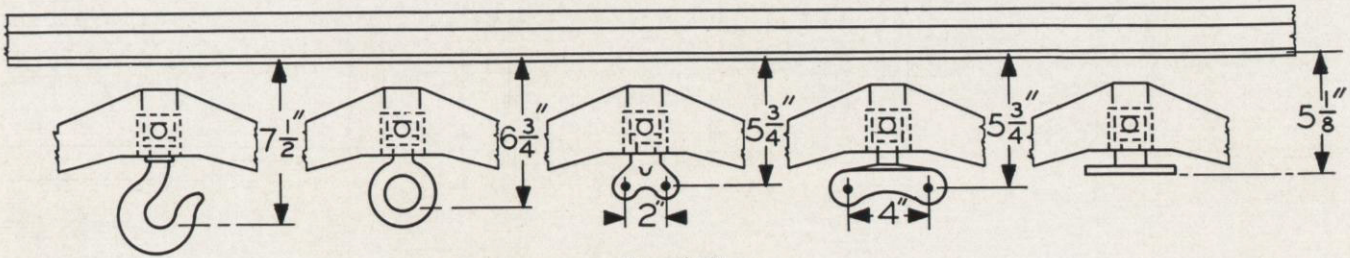
The American MonoRail eight-wheel trolley No. 175 consists of two four-wheel trolleys coupled by a heavy, alloy steel load bar. Load bearing swivels on this bar are turned nickel steel. The bar is arched to bring the load support close to the rail.

Swivel connections on all American MonoRail trolleys are carefully made to distribute the load equally on all surfaces.

The eight-wheel assembly distributes the load over a greater track flange area so that the trolley operates with extreme ease and smoothness under capacity load around short curves and over switches.



No. 62A



No. 62B

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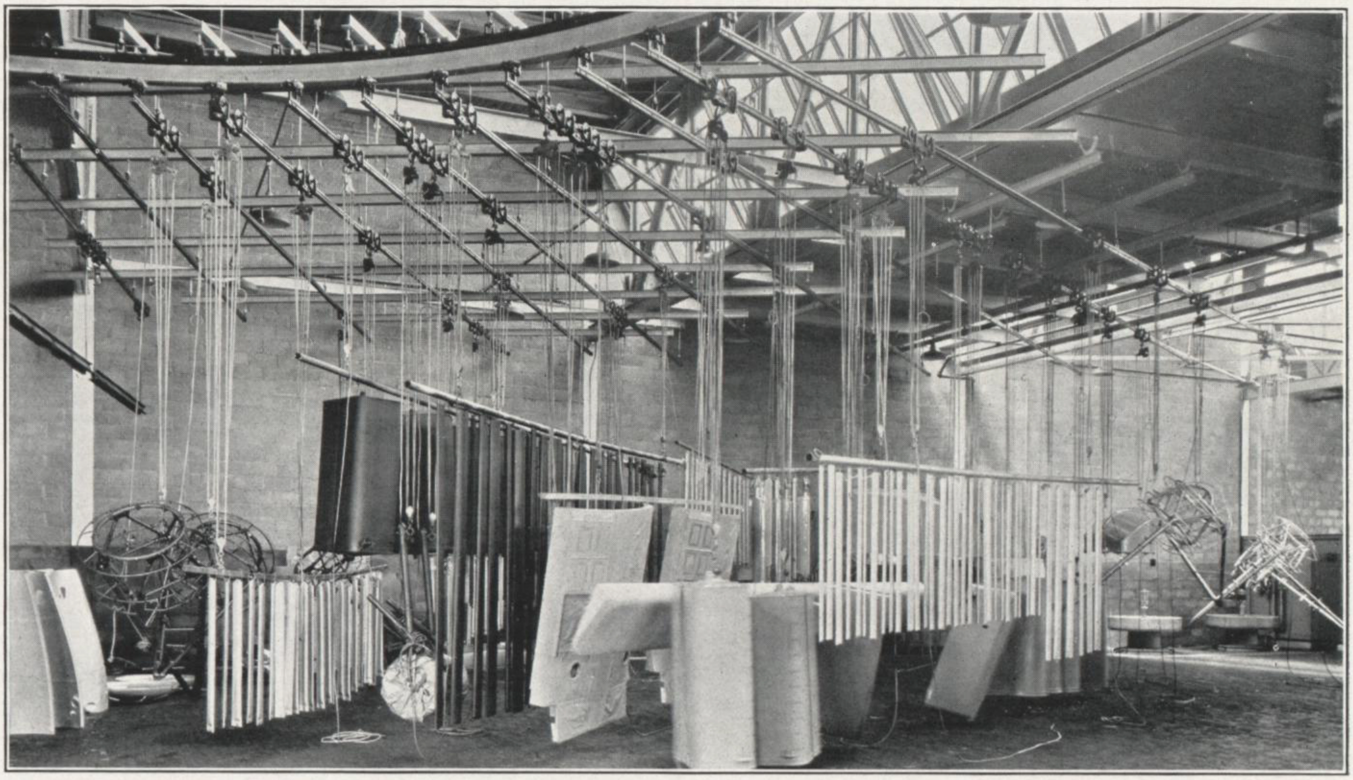


Fig. 63A *Many MonoRail trolleys are used on the overhead handling system of the Glenn L. Martin Corp. Baltimore, Md. Storage tracks shown here are used for parts after passing through the spray booth.*

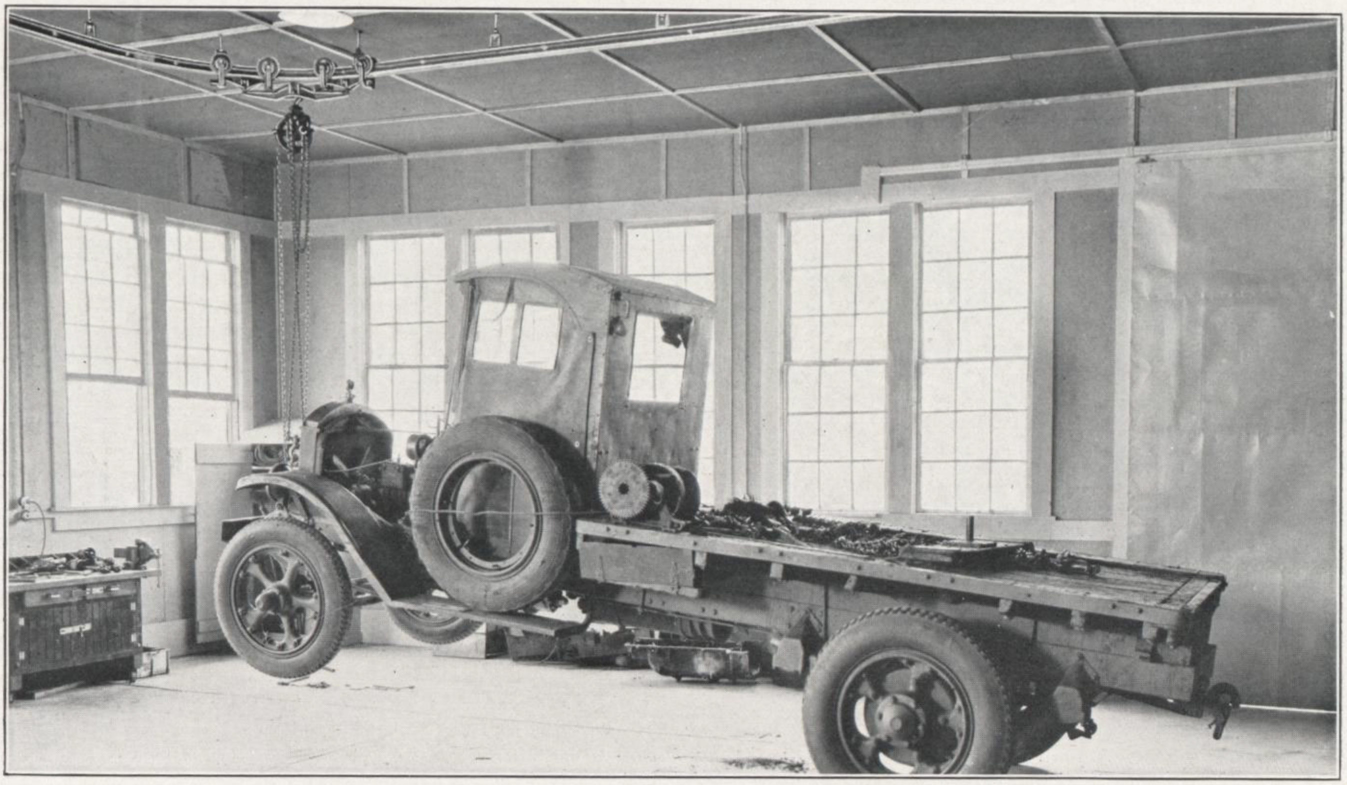
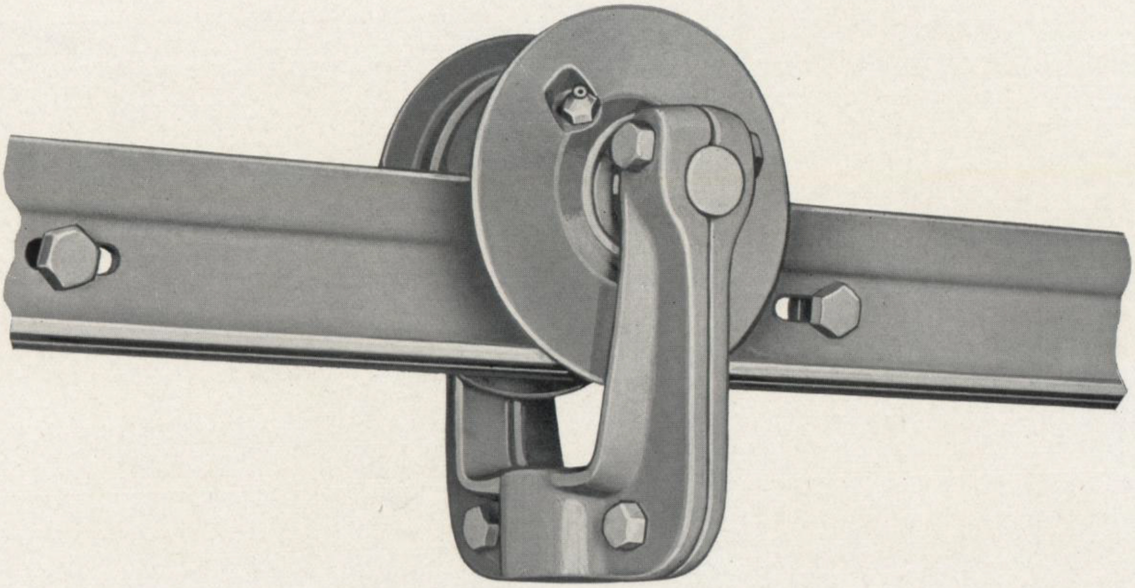


Fig. 63B *MonoRail system in automotive repair shop. Chain hoist on eight wheel trolley is used for lifting as well as carrying jobs. This lifting method leaves floor clear for workman.*



No. 157 Two-Wheel Trolley

Capacity, 750 Pounds

Specifications

Capacity: 750 pounds.
Wheels: Drop forgings, No. 164.
Wheel Yoke: Drop Forging.
Wheel Bearings: High duty, New Departure single row precision ball.
Axles: Machined steel.
Lubrication: Zerk-Alemite.
Finish: Green Enamel.
Weight: 10¾ pounds.

American MonoRail two-wheel trolley No. 157 follows in design the two-wheel trolley No. 150 with the exception of provision for extra load bearing capacity in the bearings and the provision for pressure lubrication by means of Zerk-Alemite fitting on wheels.

The wheels and wheel yoke, or frame, are drop forgings. Machine bolts are used throughout for assembly and all nuts are locked.

Two-Wheel trolley No. 157 is priced without load supporting member but can be furnished with any one of the fittings—load hook, eye, or other load carrying units as illustrated below, when so ordered and for the additional cost of the fitting.

This trolley finds application in the carrying of bars, or racks, or on the heavier type of power-driven chain propelled installation.

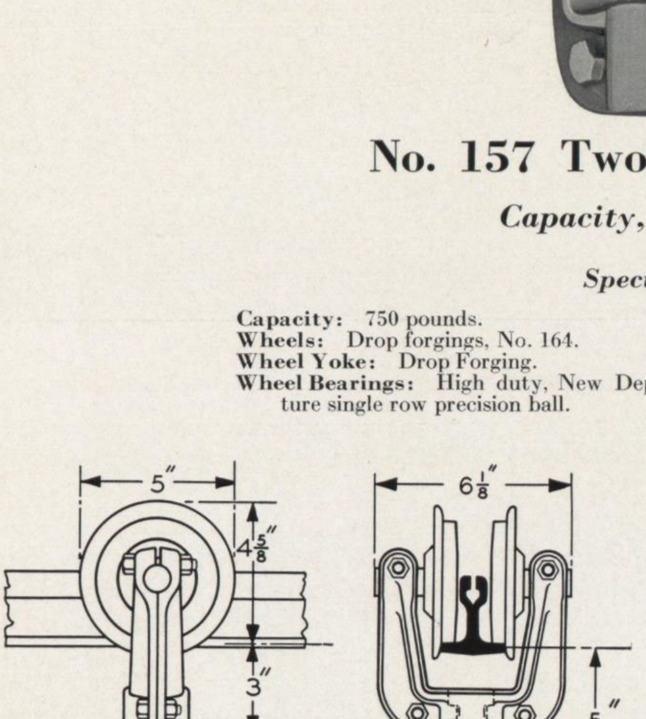


Fig. 64A

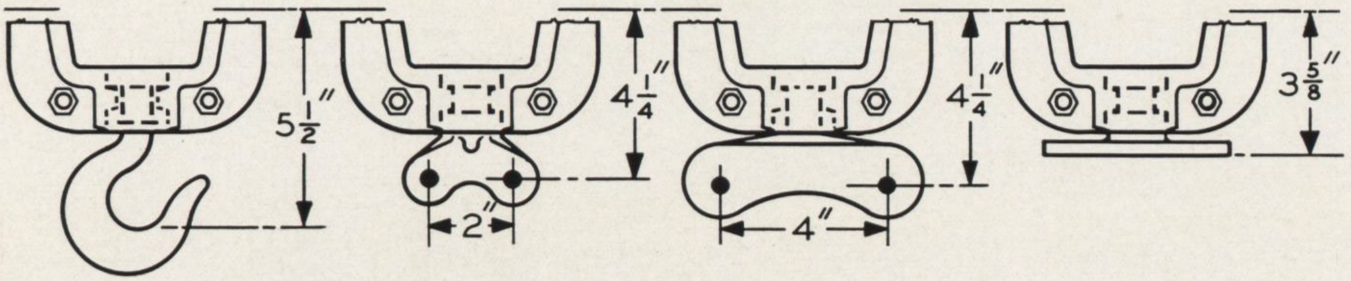
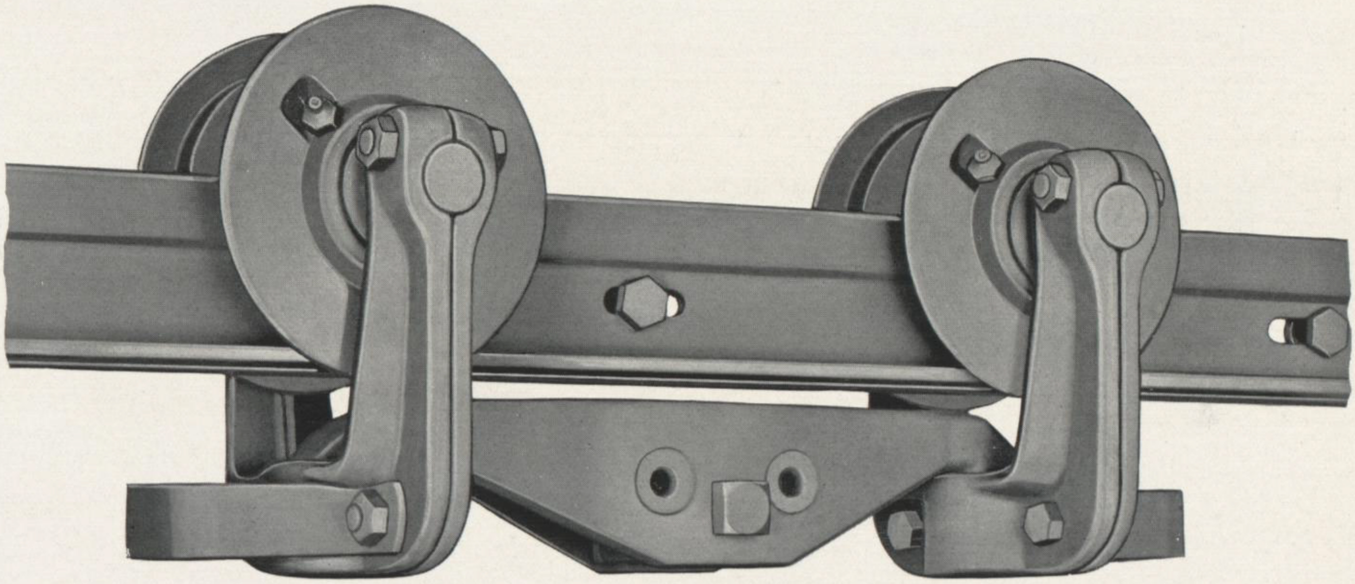


Fig. 64B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 162 Four-Wheel Trolley

Capacity, 1500 Pounds

Specifications

Capacity: 1500 pounds.
Wheels: Drop forgings, No. 164.
Wheel Yokes: Drop forgings.
Wheel Bearings: High duty New Departure single row precision ball.
Axles: Machined steel.
Lubrication: Zerk-Alemite.
Load Bar: Drop forging.
Load Bar: Furnished regularly with improved internal hoist hook bearing.
Load Bar: Will be furnished with any one of the fittings—load hook, eye, or clevises as illustrated below, when so ordered and at no additional cost.
Finish: Green Enamel.
Weight: 30 pounds.

American MonoRail four-wheel trolley No. 162 is made up of two two-wheel No. 157 trolleys coupled by the drop forged load bar.

The load bar is assembled on top of the drop forged wheel yoke or trolley frame, with a saving of headroom by bringing the load support close to the rail.

The drop forged load bar is regularly equipped with the internal hoist hook bearing, but any one of the load carrying units shown below will be supplied on order, at no additional cost.

Trolleys are equipped with bumpers so that any number of them may be pushed along the track without wheels binding. This trolley travels smoothly over track, through switches, and around curves as short as 12″ radius when loaded or empty.

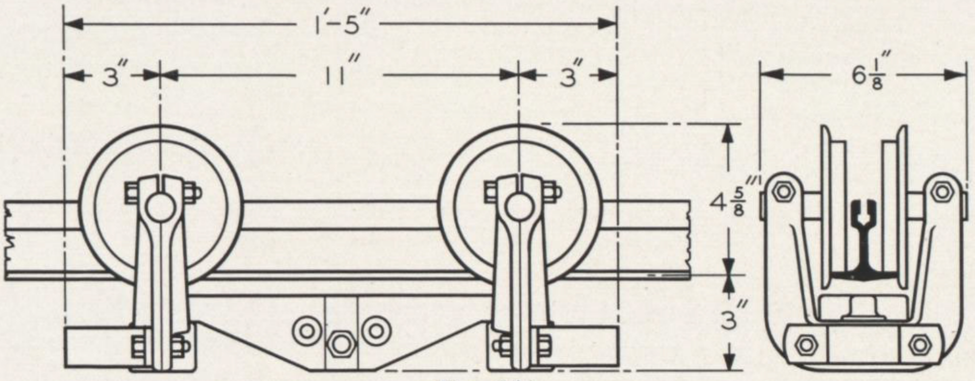


Fig. 65A

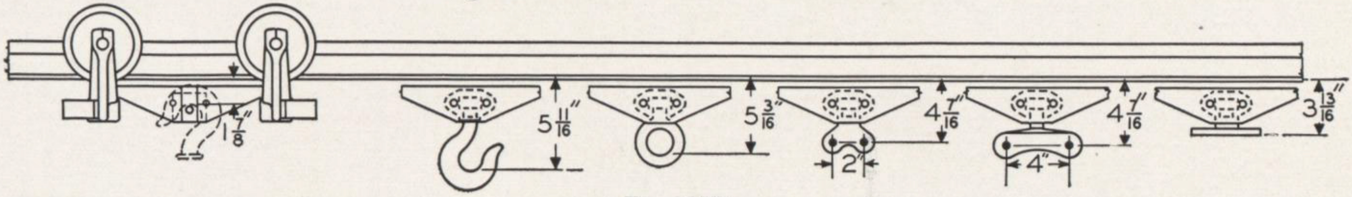


Fig. 65B

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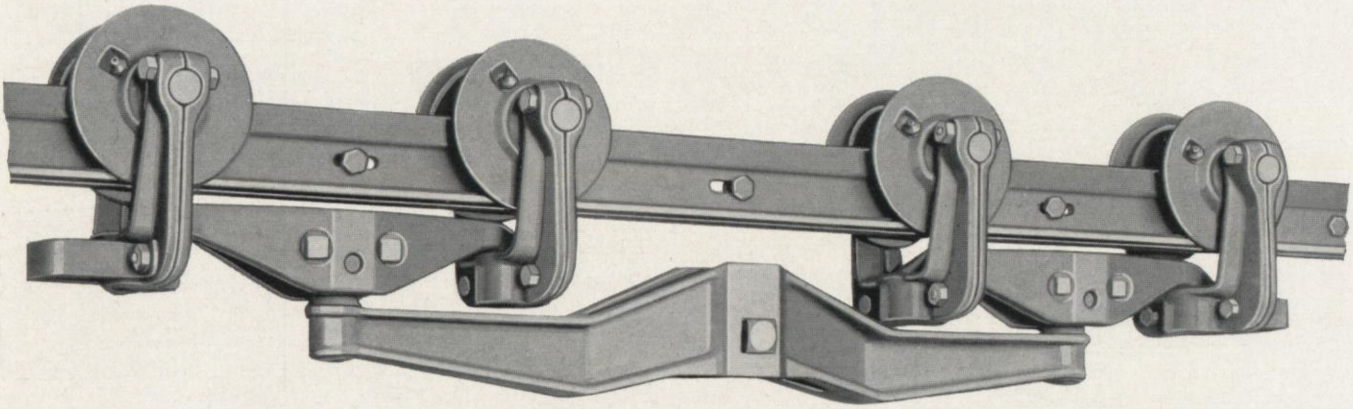

No. 171 Eight-Wheel Trolley

Capacity, 3000 Pounds

Specifications

Capacity: 3000 pounds.
Wheels: Drop forgings, No. 164.
Wheel Yokes: Drop Forgings.
Wheel Bearings: High duty New Departure single row precision ball.
Axles: Machined steel.
Lubrication: Zerk-Alemite.
Load Bar: Alloy steel casting with end swivels of turned nickel steel.
Load Bar: Furnished regularly with improved internal hoist hook bearing.
Load Bar: Will be furnished with any one of the fittings—load hook, eye, or clevises as illustrated below, when so ordered, at no extra cost.
Finish: Green Enamel.
Weight: 75 pounds.

American MonoRail eight-wheel trolley No. 171 consists of two four-wheel trolleys, No. 162, coupled by a heavy alloy steel load bar. The use of swivel connections on all American MonoRail trolleys spreads the load uniformly over the whole wheel base

The eight-wheel assembly distributes the load over a greater track flange area so that the trolley operates with ease and smoothness around short curves and over switches.

Load bar is regularly fitted with hoist hook bearing, but will be furnished with any one of the fittings illustrated below, when so ordered, at no additional cost.

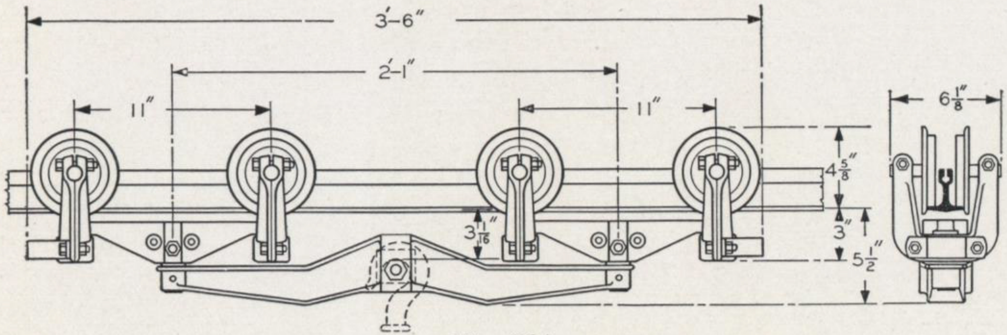

Fig. 66A

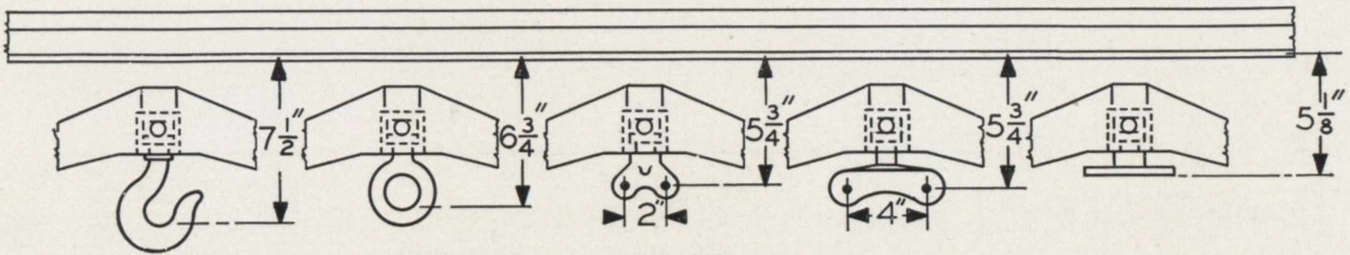

Fig. 66B

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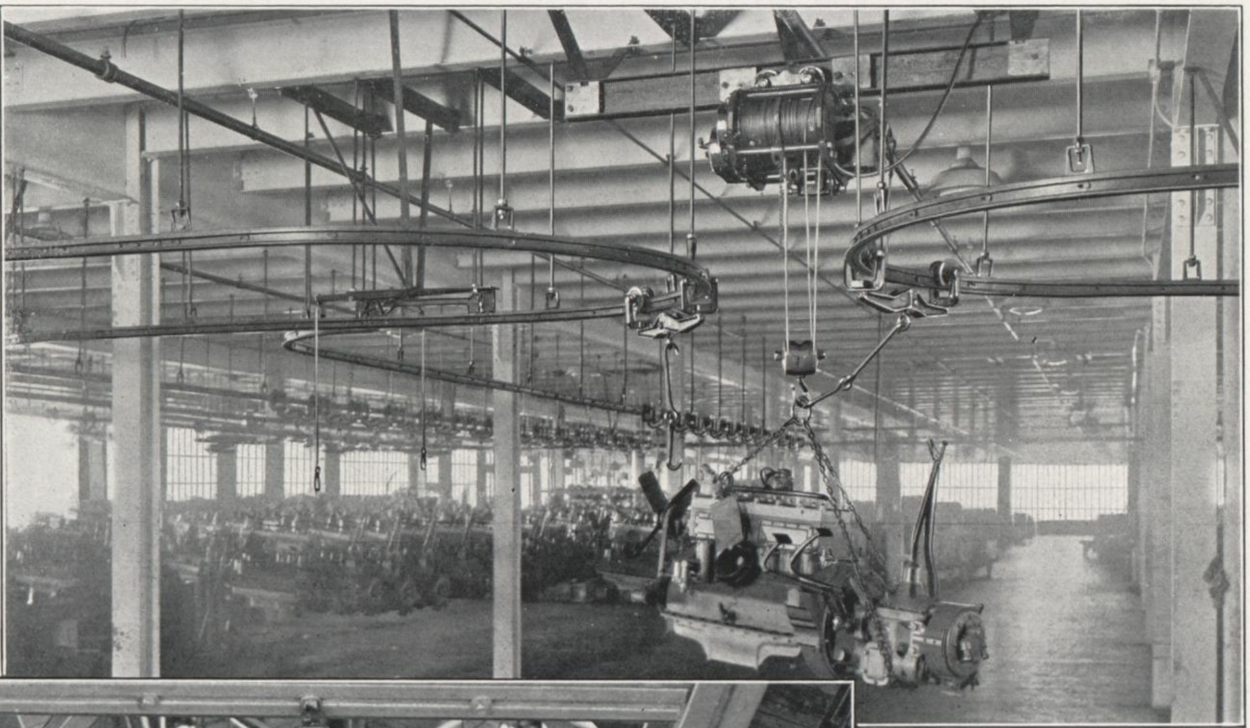


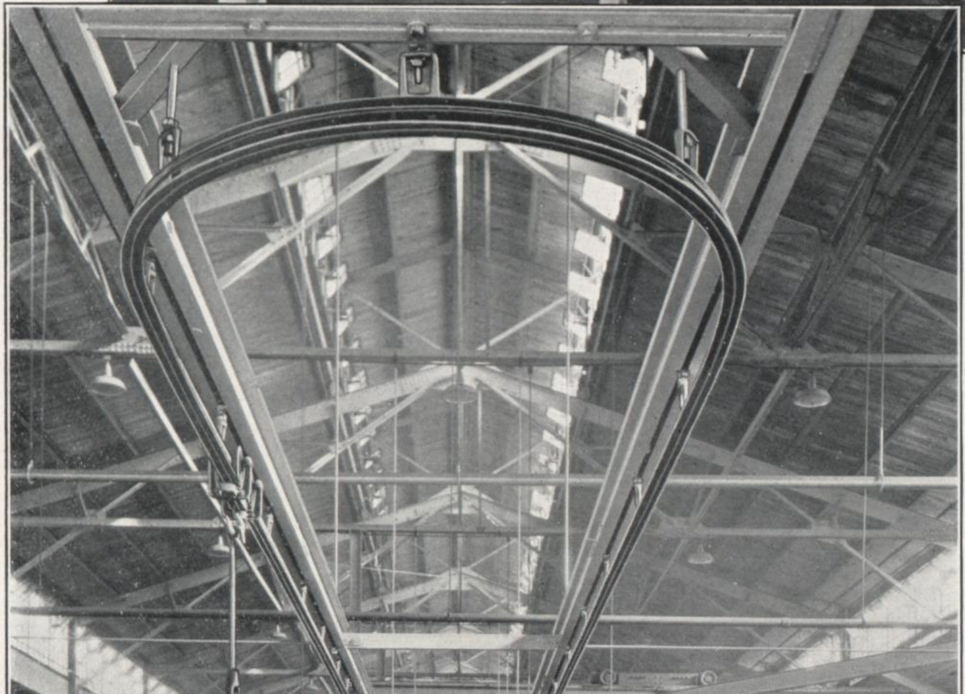
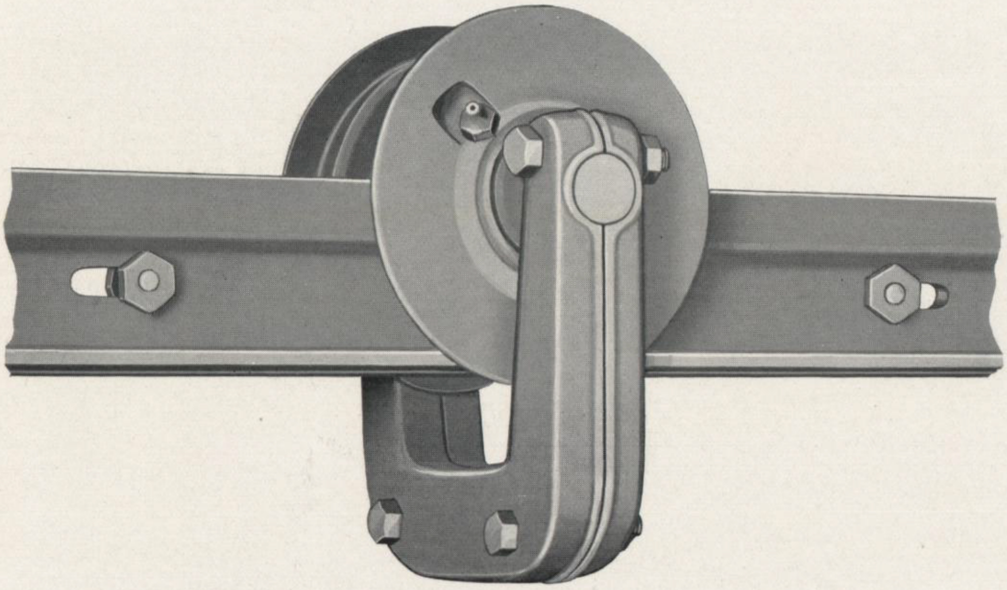


Fig. 67A: *Where two Mono-Rail lines meet to discharge their loads to the floor below in the plant of a large automobile builder. Electric hoist serves both lines.*

Fig. 67B: *Part of a Mono-Rail heavy duty installation in The Columbia Malleable Castings Corporation, Columbia, Pa. Two lines of track run through the center of the foundry to the malleable furnace in the background.*



No. 179 Two-Wheel Trolley

Capacity, 1000 Pounds

Specifications

Capacity: 1000 pounds.

Wheels and Wheel Yoke: Drop forgings. Wheel No. 164.

Wheel Bearings: High Duty New Departure single row precision ball.

Axles: Machined steel.

Lubrication: Zerk-Alemite.

Finish: Green Enamel.

Weight: 11¼ pounds.

MonoRail trolleys Nos. 179, 180 and 181, have been developed for that class of materials handling calling for load carrying capacity in excess of the ratings of MonoRail trolleys, Nos. 157, 162, 171.

The extra duty has been built into this series of trolleys by the use of a more powerful yoke and wheel assembly, and, in the four and eight-wheel trolleys, by the heavier and stronger load bars and longer wheel bases.

The two-wheel trolley shown above has a rated capacity of 1000 pounds with an ample factor of reserve strength.

This trolley is priced without load supporting member, but can be furnished, on request, with any one of the fittings—load hook, eye, clevis or other swivels as illustrated below at the additional cost of the fitting. These drawings give also all dimensions and clearances.

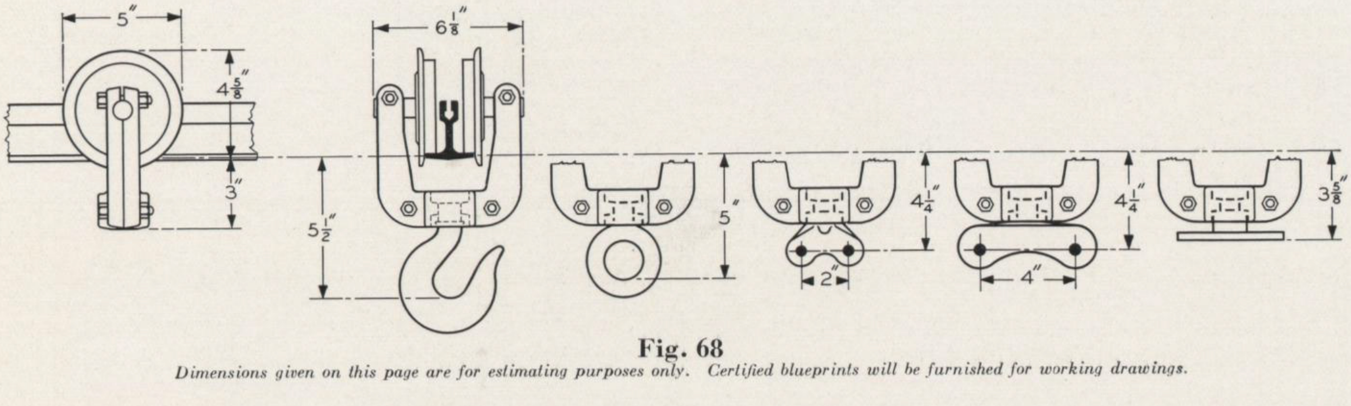
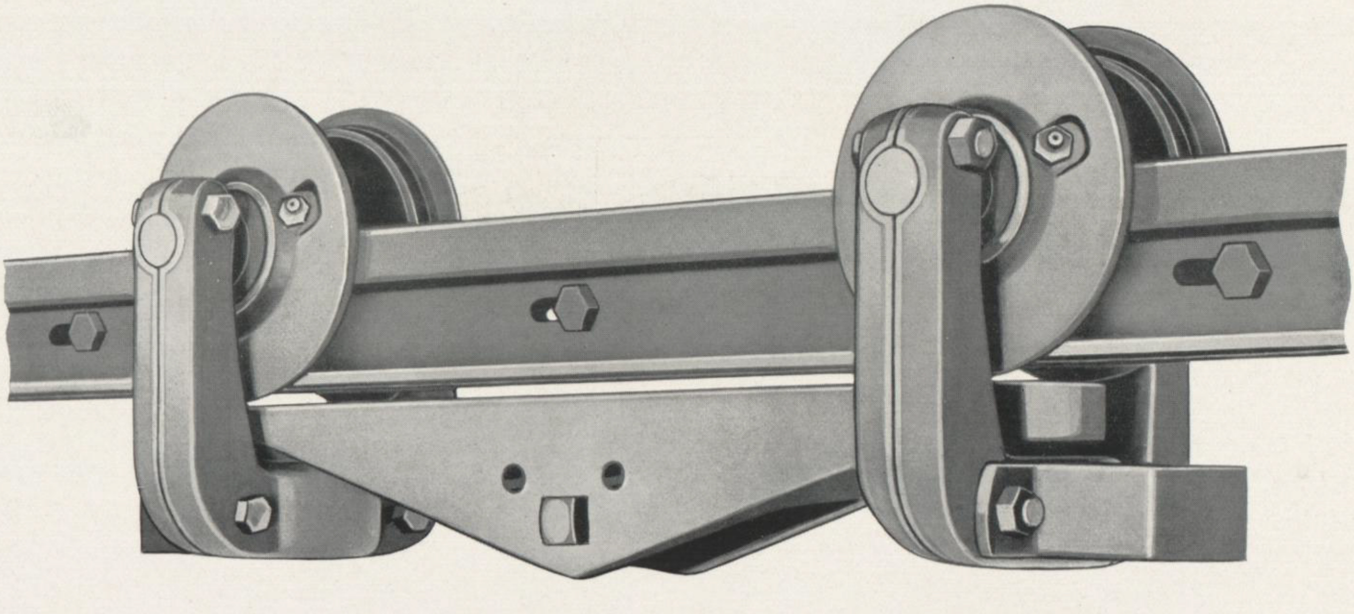


Fig. 68

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 180 Four-Wheel Trolley

Capacity, 2000 Pounds

Specifications

Capacity: 2000 pounds.
Wheels and Wheel Yokes: Drop forgings. Wheel No. 164.
Wheel Bearings: High Duty New Departure single row precision ball.
Axles: Machined Steel.
Lubrication; Zerk-Alemite.
Load Bar: Drop forging. Furnished regularly with hoist hook bearing. Will be furnished, if so ordered, with any one of the fittings—load hook, eye, clevis or swivels as below, at no additional cost.
Finish: Green Enamel.
Weight: 34 pounds.

Four-wheel Trolley No. 180 has been designed and built for ton loads which it will handle efficiently and continuously. Note the use of drop forgings throughout.

The forged steel load bar used in this combination of two two-wheel No. 179 trolleys has been designed for this assembly. It is fitted regularly with drop forged bearing for hoist hook, but will be equipped with any one of the load carrying members shown in the line illustration below at no extra cost.

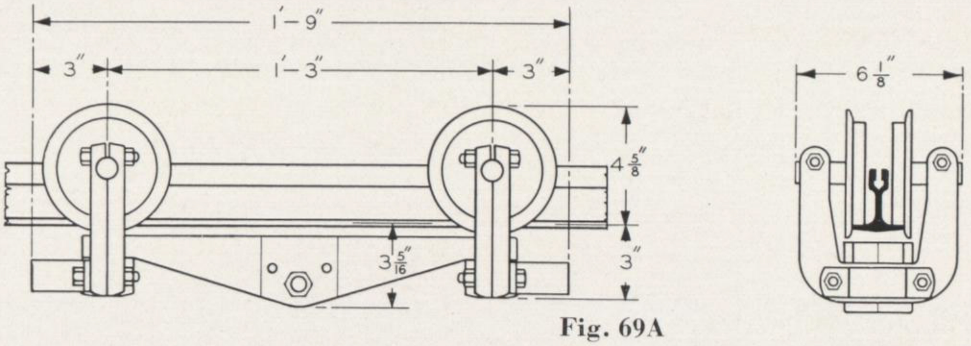


Fig. 69A

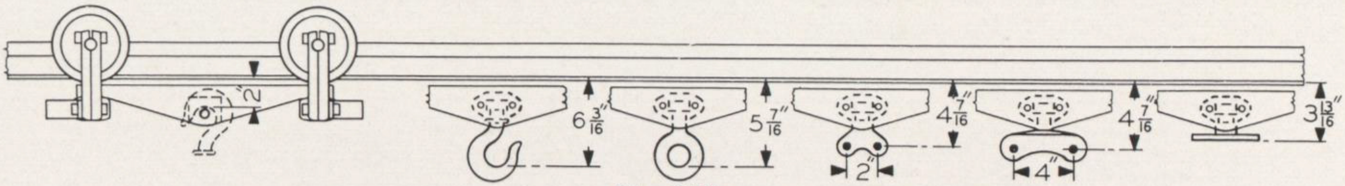


Fig. 69B

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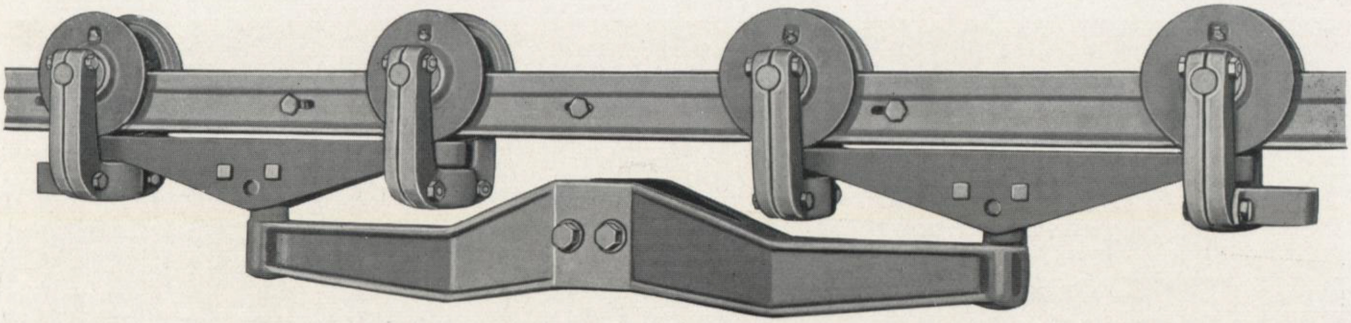


No. 181 Eight-Wheel Trolley

Capacity, 4000 Pounds

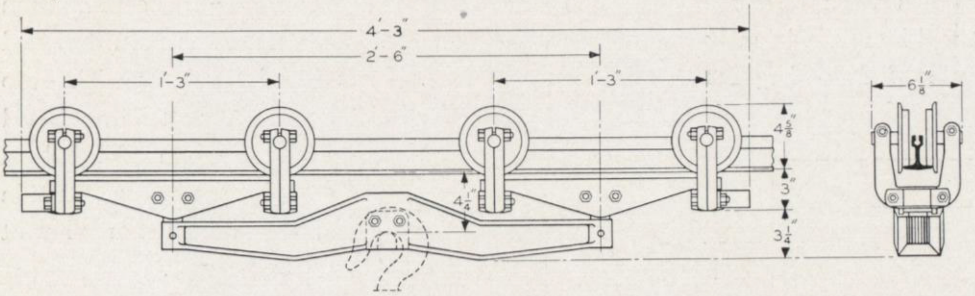
Specifications

Capacity: 4000 pounds.
Wheels and Wheel Yokes: Drop forgings. Wheel No. 164.
Wheel Bearings: High Duty New Departure single row precision ball.
Axles: Machined steel.
Lubrication: Zerk-Alemite.
Load Bar: Special. Alloy steel casting. Furnished regularly with hoist hook bearing. May be fitted with any one of the alternative load suspension units shown below, at no extra cost.
Finish: Green Enamel.
Weight: 100 pounds.

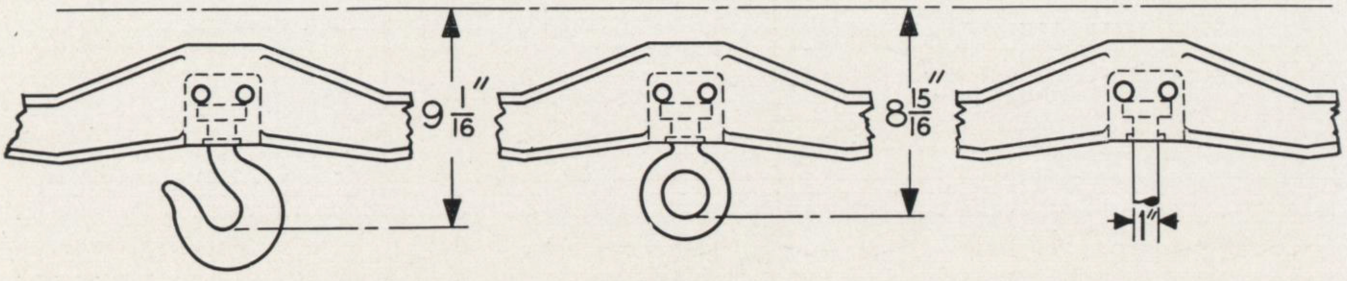
Load bars and wheel and yoke assembly, designed for extra duty combine to give this eight-wheel trolley its two-ton capacity rating.

Built up to American MonoRail standards in every detail of material and workmanship, the No. 181, eight-wheel trolley can be depended on for continuous, trouble-free service where handling requirements are rigorous, where duty is continuous and loads are heavy. Foundry service is typical of the sort of installation for which this trolley is especially adapted.

The load bar on this trolley is regularly furnished with standard hoist hook bearing, but any one of the fittings shown below will be furnished on order at no extra cost.



No. 70A



No. 70B

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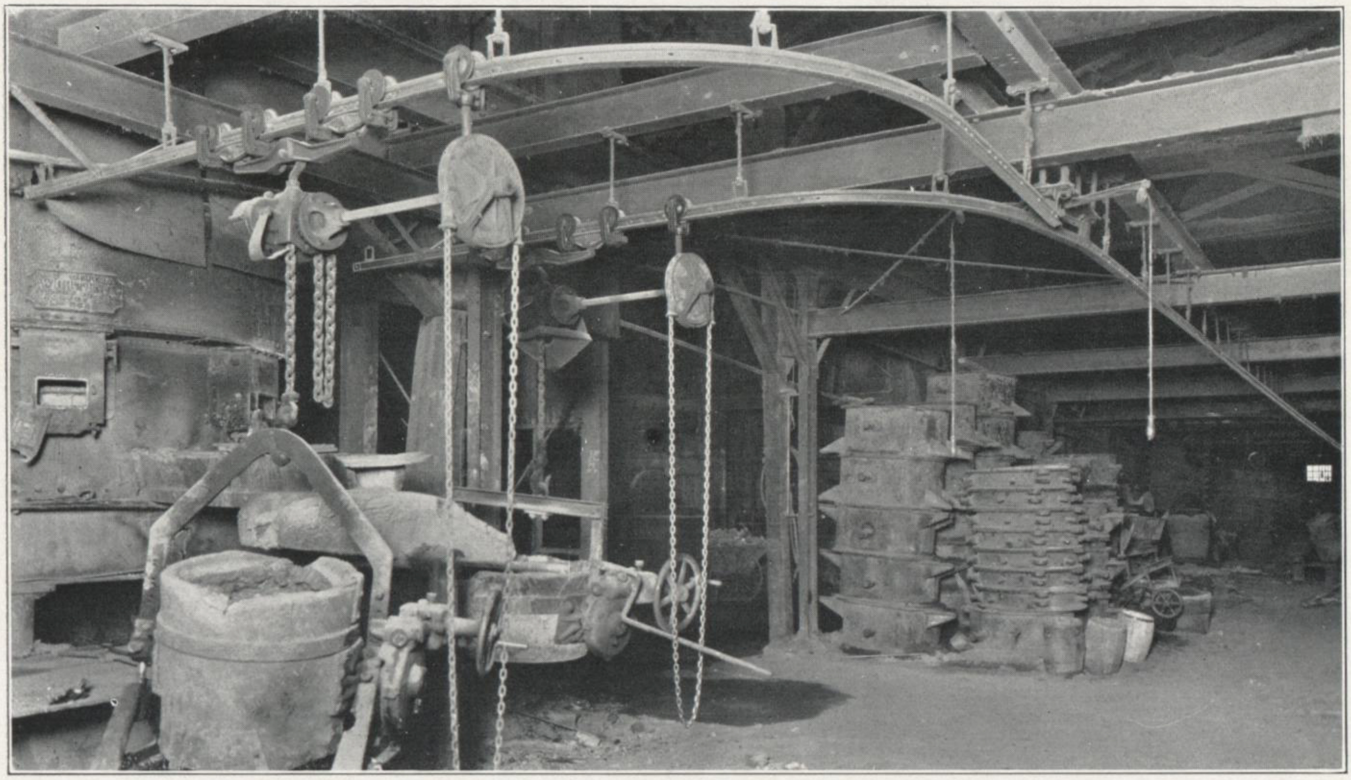


Fig. 71A *A heavy-duty foundry installation. Eight wheel MonoRail trolleys handle the ladles of molten metal. Note the extended hand wheel on the hoist to protect operator.*

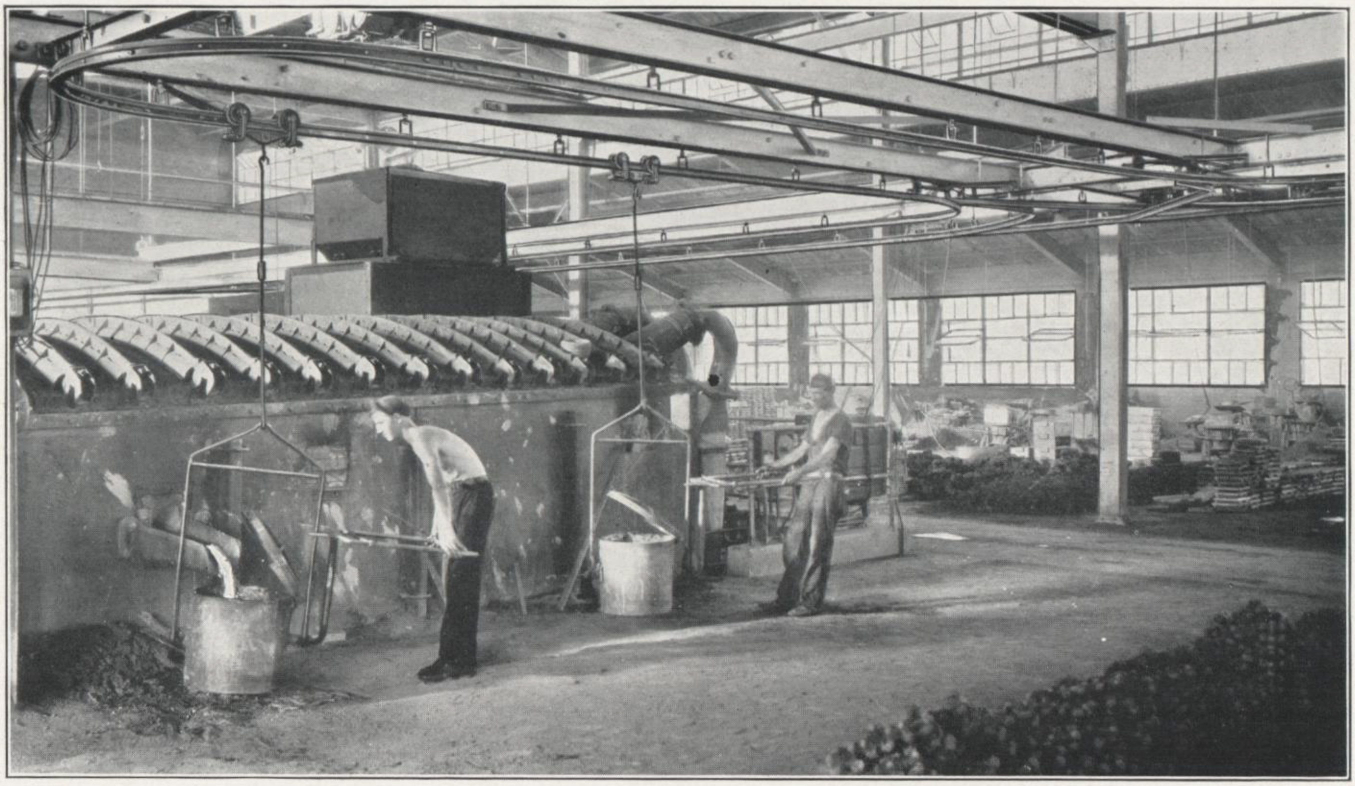
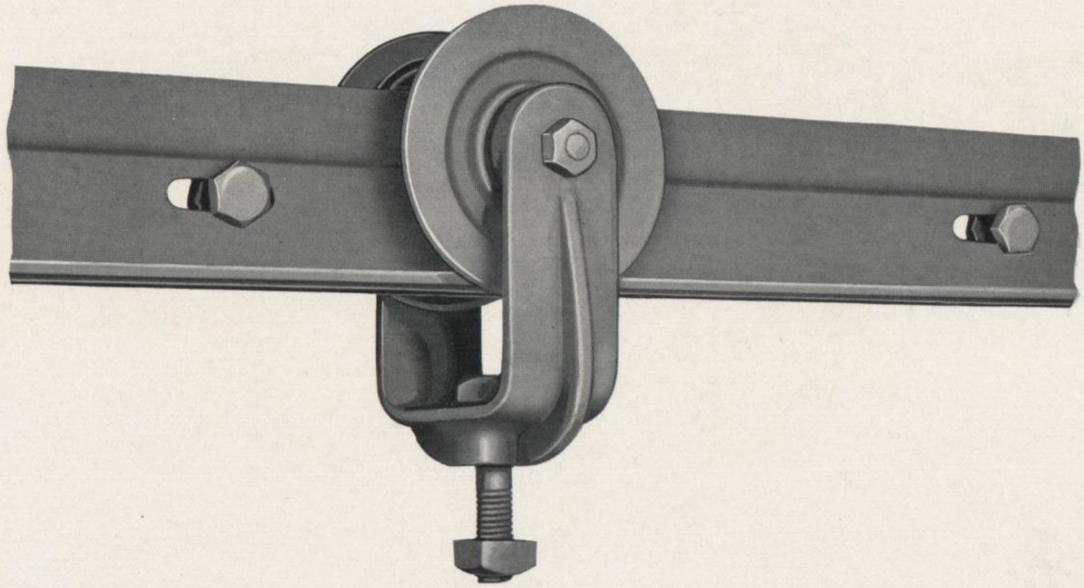


Fig. 71B *This shows a loop of MonoRail track at the furnace in the foundry of the Columbia Malleable Castings Corp., Columbia, Pa. This loop connects with two lines of track running through the foundry.*



No. 188 Two-Wheel Trolley

Capacity, 250 Pounds

Specifications

Capacity: 250 pounds.
Wheels: Drop forgings, No. 123.
Wheel Yoke: Malleable casting.
Wheel Bearings: Self-contained ball.
Axles: Machined steel
Lubrication: Oil hole in wheel face.
Finish: Green Enamel.
Weight: 3½ pounds.

American MonoRail Trolleys Nos. 188 and 189 have been designed to meet the need for conveying equipment in the hundreds of applications where the many comparatively light loads to be handled do not justify the cost of the heavier duty trolleys.

These MonoRail Trolleys are sturdy, free-running, and guaranteed for satisfactory service carrying loads within their rated capacity.

The drop forged steel wheels are mounted on self-contained ball bearings. The wheels are carried in a malleable iron yoke. While the two-wheel trolley shown above can be used in single units, it is especially recommended for use in pairs, attached to carrying bars, special racks, or for power-operated chain-driven installations where any number of trolleys can be connected.

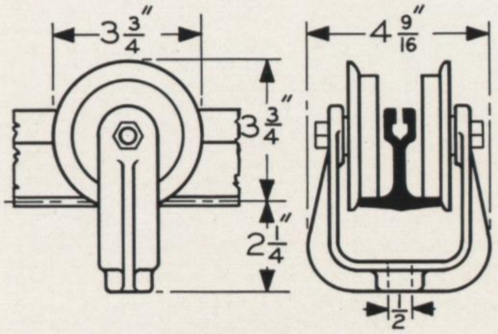


Fig. 72

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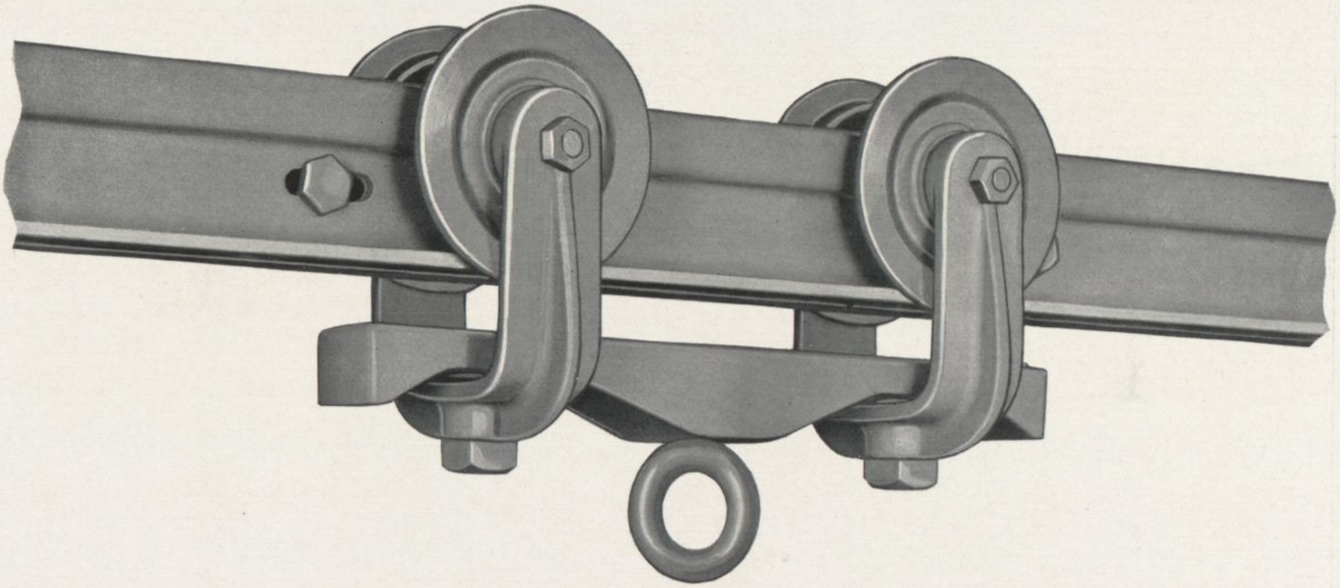

No. 189 Four-Wheel Trolley

Capacity, 500 pounds

Specifications

Capacity: 500 pounds.
Wheels: Drop forgings No. 123.
Wheel Yokes: Malleable casting.
Wheel Bearings: Self-contained ball.
Axles: Machined steel.
Load Bar: Malleable iron.
Load Support: Vulcan forged eye bolt.
Lubrication: Through oil hole in wheel face.
Finish: Green Enamel.
Weight: 10½ pounds.

Four-wheel American MonoRail Trolley No. 189 is designed for loads up to 500 pounds. It is a sturdy, free-running ball bearing trolley. It can be used in the ordinary way as single units, or for carrying racks or special carriers.

Where the application is for light loads and requires a great many trolleys, the great carrying strength of the American MonoRail rail section will permit a wider spacing of hangers and the covering of longer spans. In most cases this will eliminate special supporting superstructure, bringing the cost of both equipment and installation down to a point where for even very light service the investment is justified—an investment on which interest charges will not eat up profits.

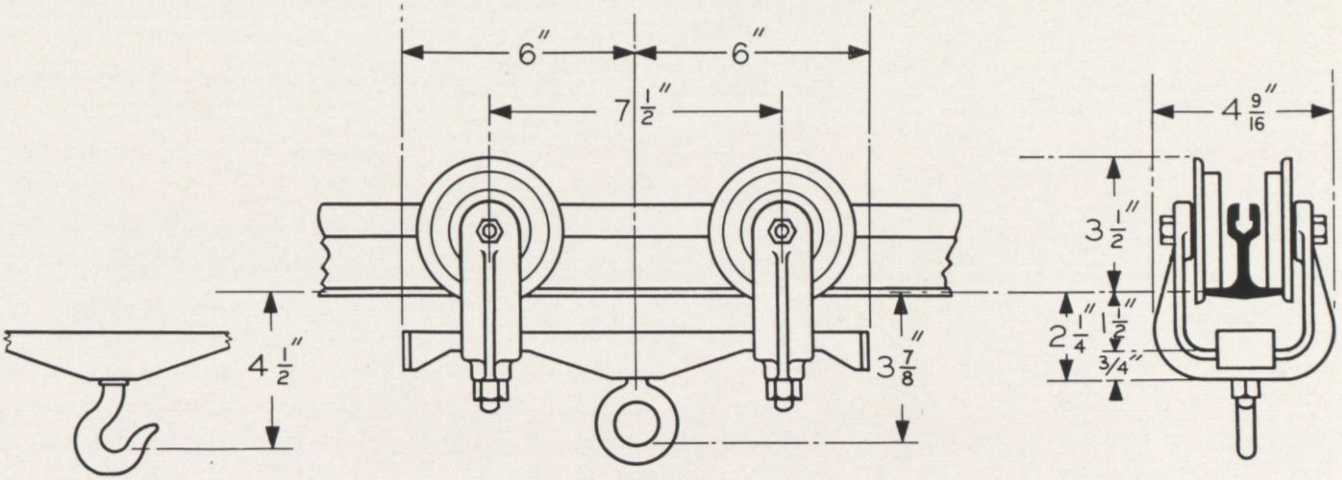

Fig. 73

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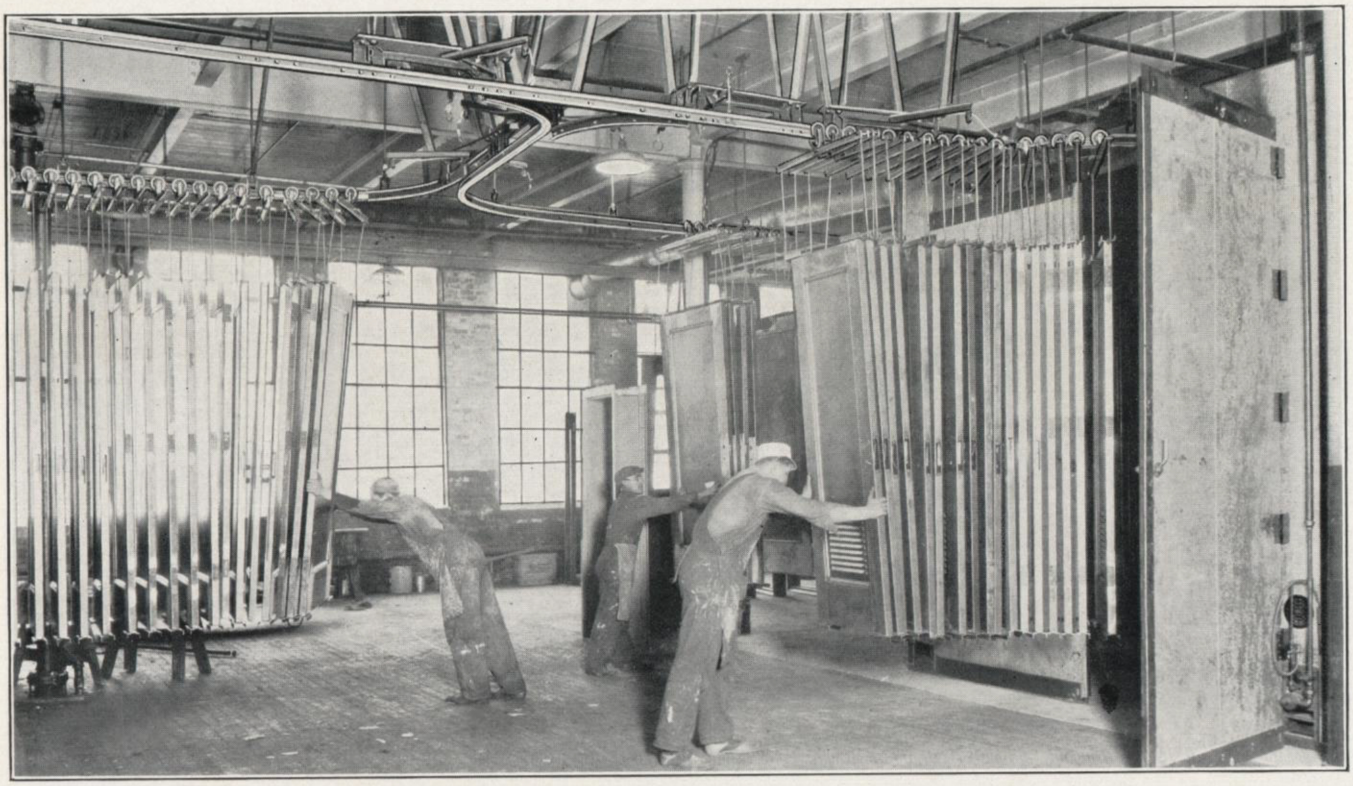


Fig. 74A *MonoRail trolleys handling steel doors in plant of Steelbilt Products Corp., Clifton, N. J. Note that one man can easily push seventeen doors.*

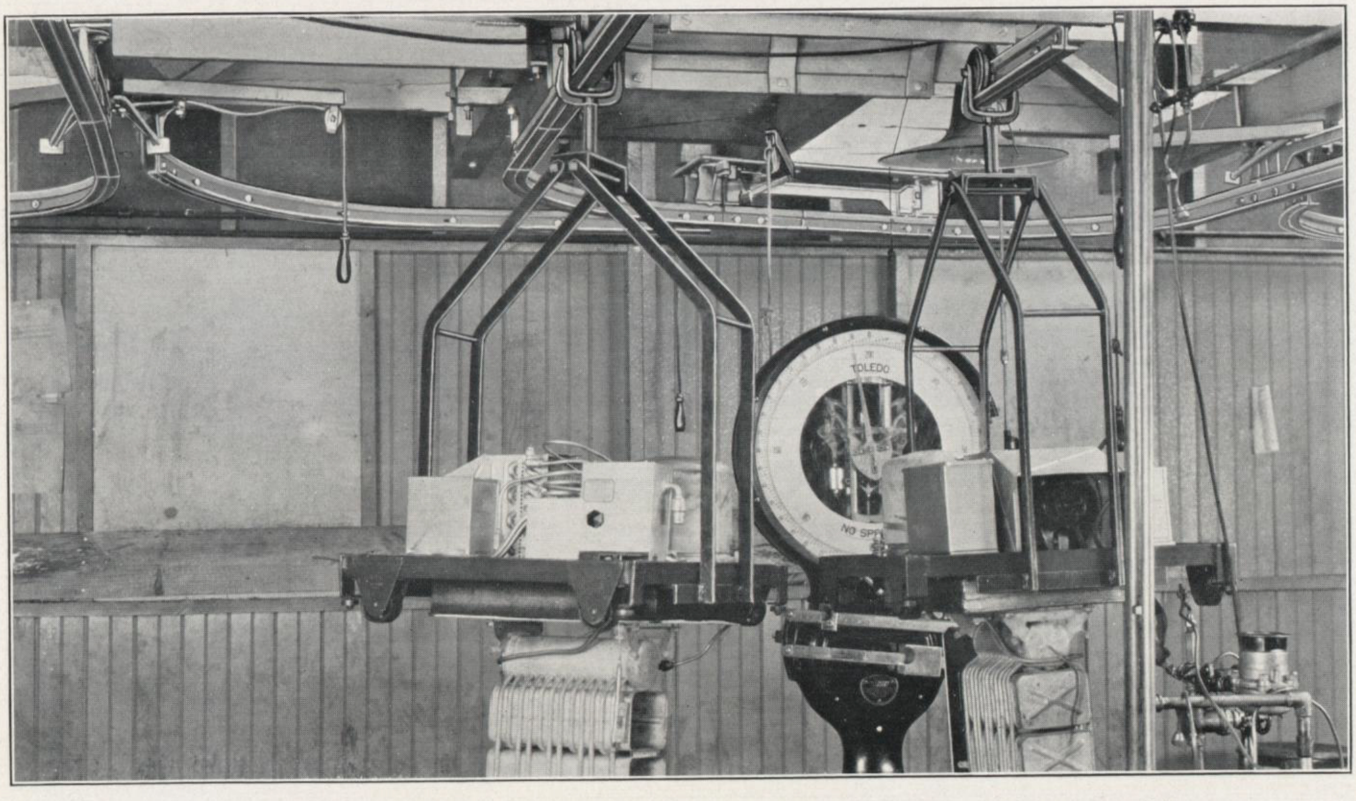
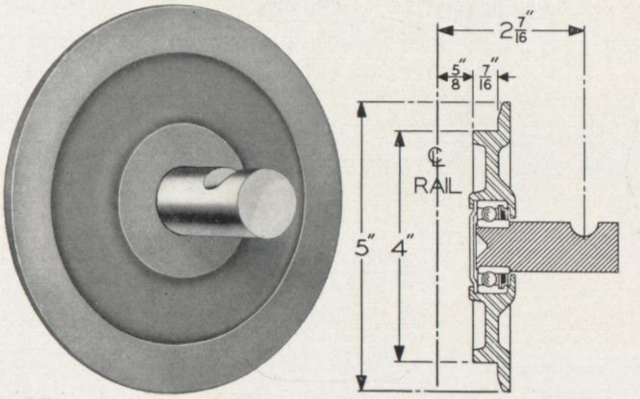
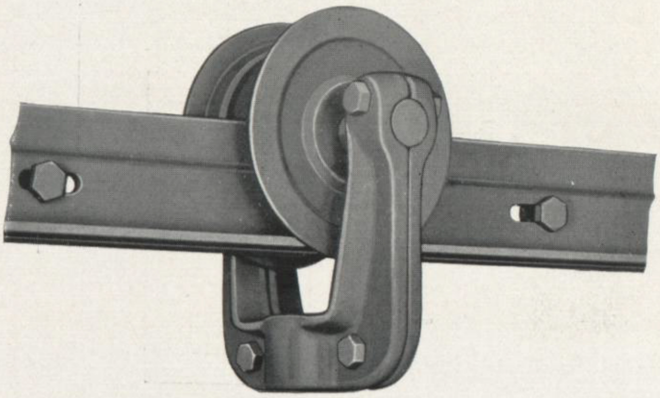


Fig. 74B *Refrigerator parts on MonoRail trolleys in the plant of the Grigsby-Grunow Company, Chicago. Special switch permits removal of unit for test, at the same time closing the main line for through traffic. Track scale section permits weighing in transit.*

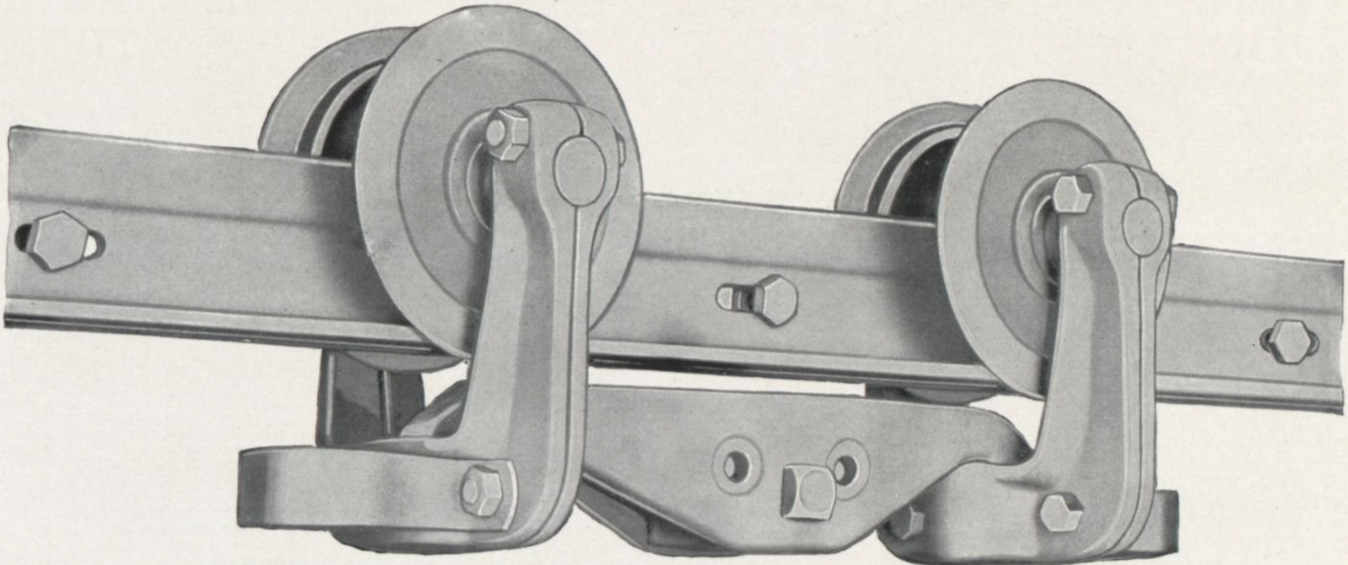
MonoRail Trolleys Equipped With Oil-Seal Bearings



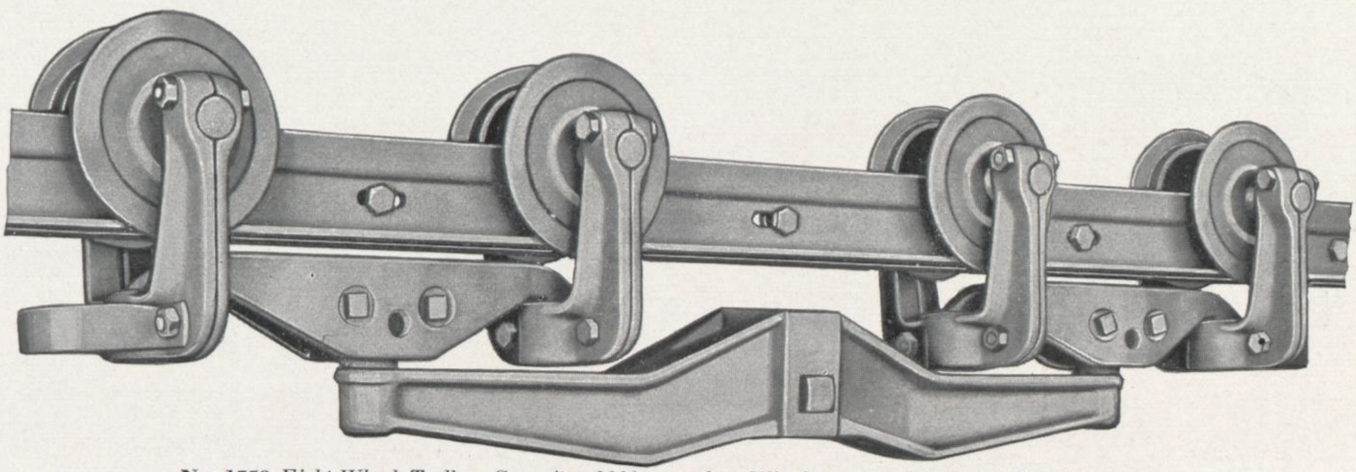
No. 152 *Trolley Wheel, Equipped with Oil-Seal Bearings.*



No. 1502 *Two-Wheel Trolley, Capacity, 500 pounds. Wheels equipped with Oil-Seal Bearings.*



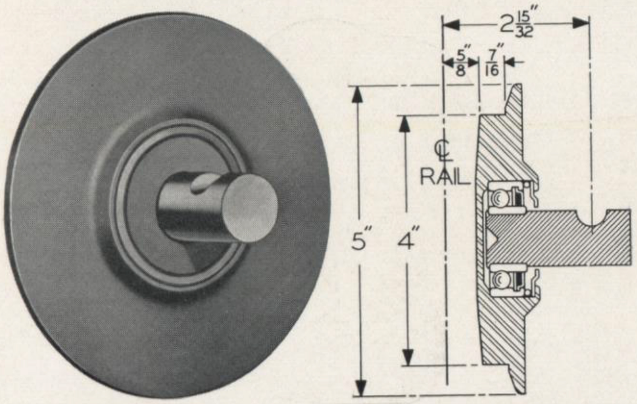
No. 1654 *Four-Wheel Trolley, Capacity, 1000 pounds. Wheels equipped with Oil-Seal Bearings.*



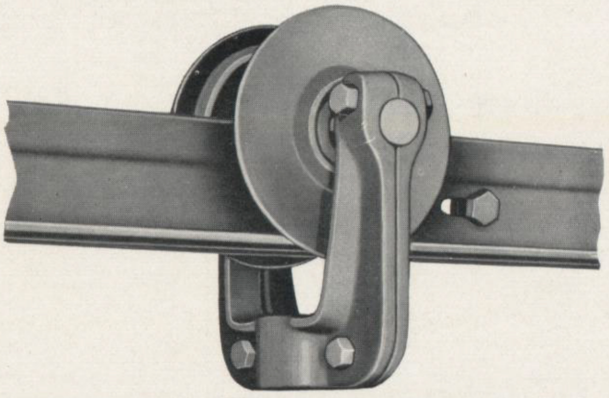
No. 1758 *Eight-Wheel Trolley, Capacity, 2000 pounds. Wheels equipped with Oil-Seal Bearings.*

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

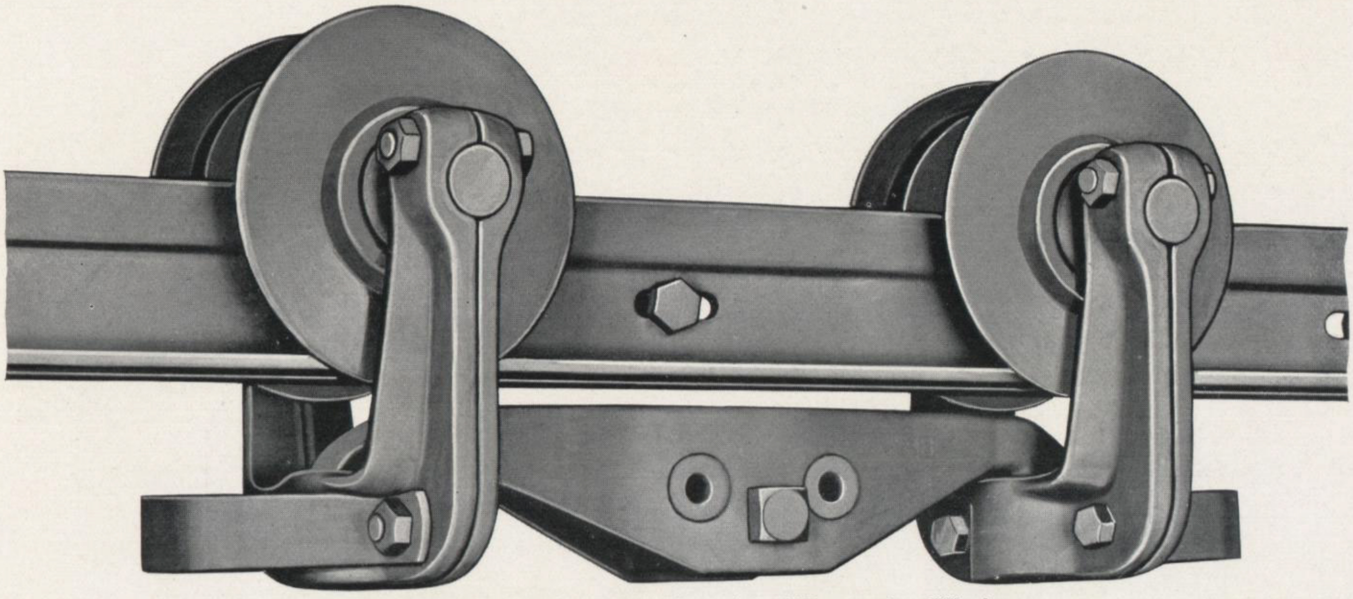
MonoRail Trolleys Equipped with Oil-Seal Bearings



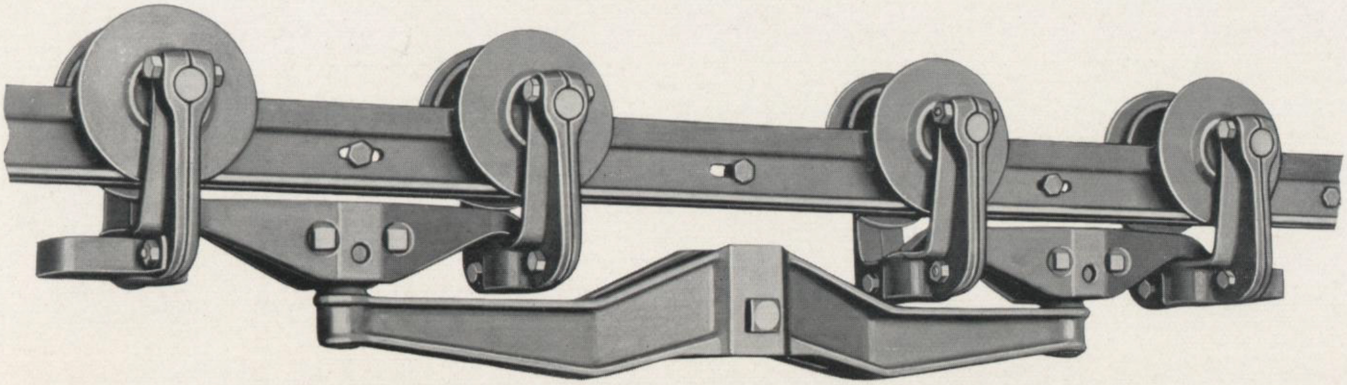
No. 192 *Trolley Wheel, Equipped with Oil-Seal Bearings.*



No. 1572 *Two-Wheel Trolley, Capacity, 750 pounds. Equipped with Oil-Seal Bearings.*



No. 1624 *Four-Wheel Trolley, Capacity, 1500 pounds. Wheels equipped with Oil-Seal Bearings.*



No. 1718 *Eight-Wheel Trolley, Capacity, 3000 pounds. Wheels equipped with Oil-Seal Bearings.*

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

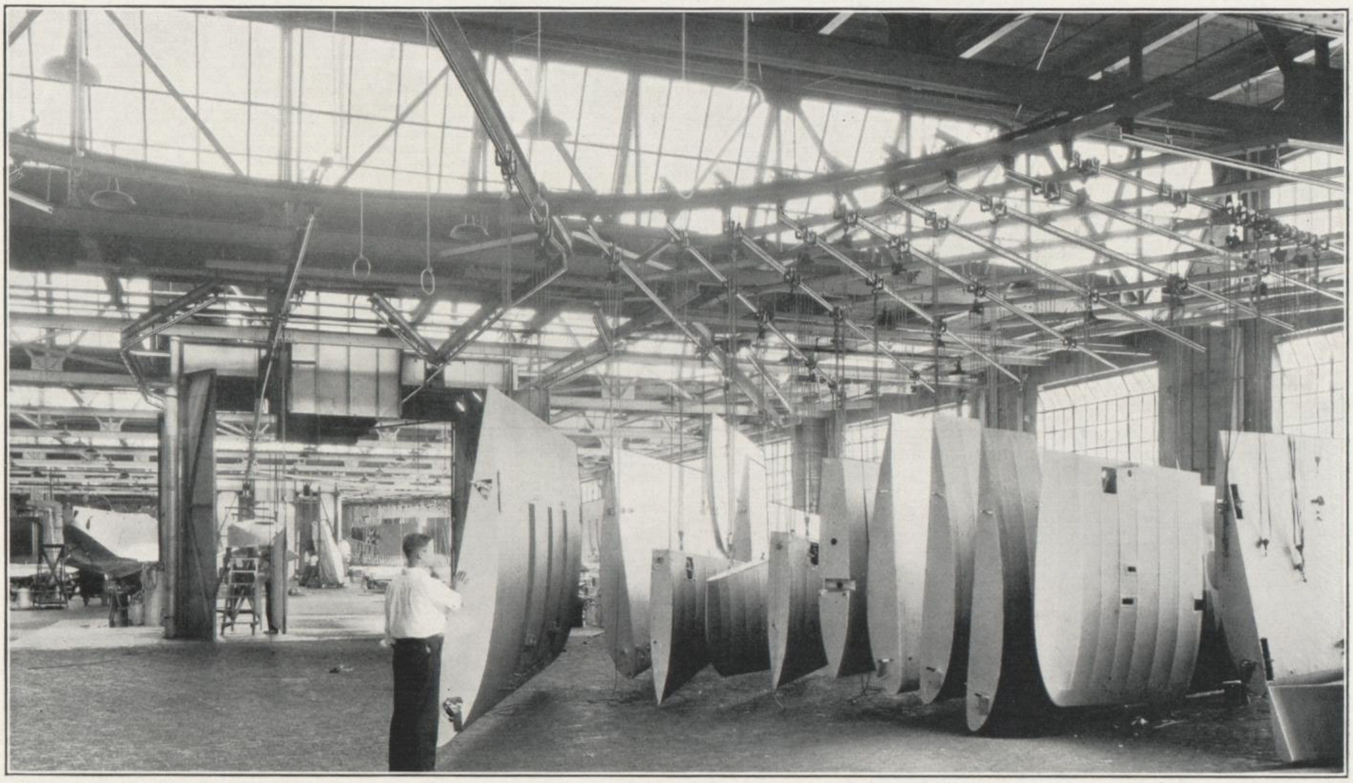


Fig. 77A *Wing storage on MonoRail track in the Glenn L. Martin Corp., plant at Baltimore, Md. Illustration shows a few of the many trolleys required to handle parts in storage.*

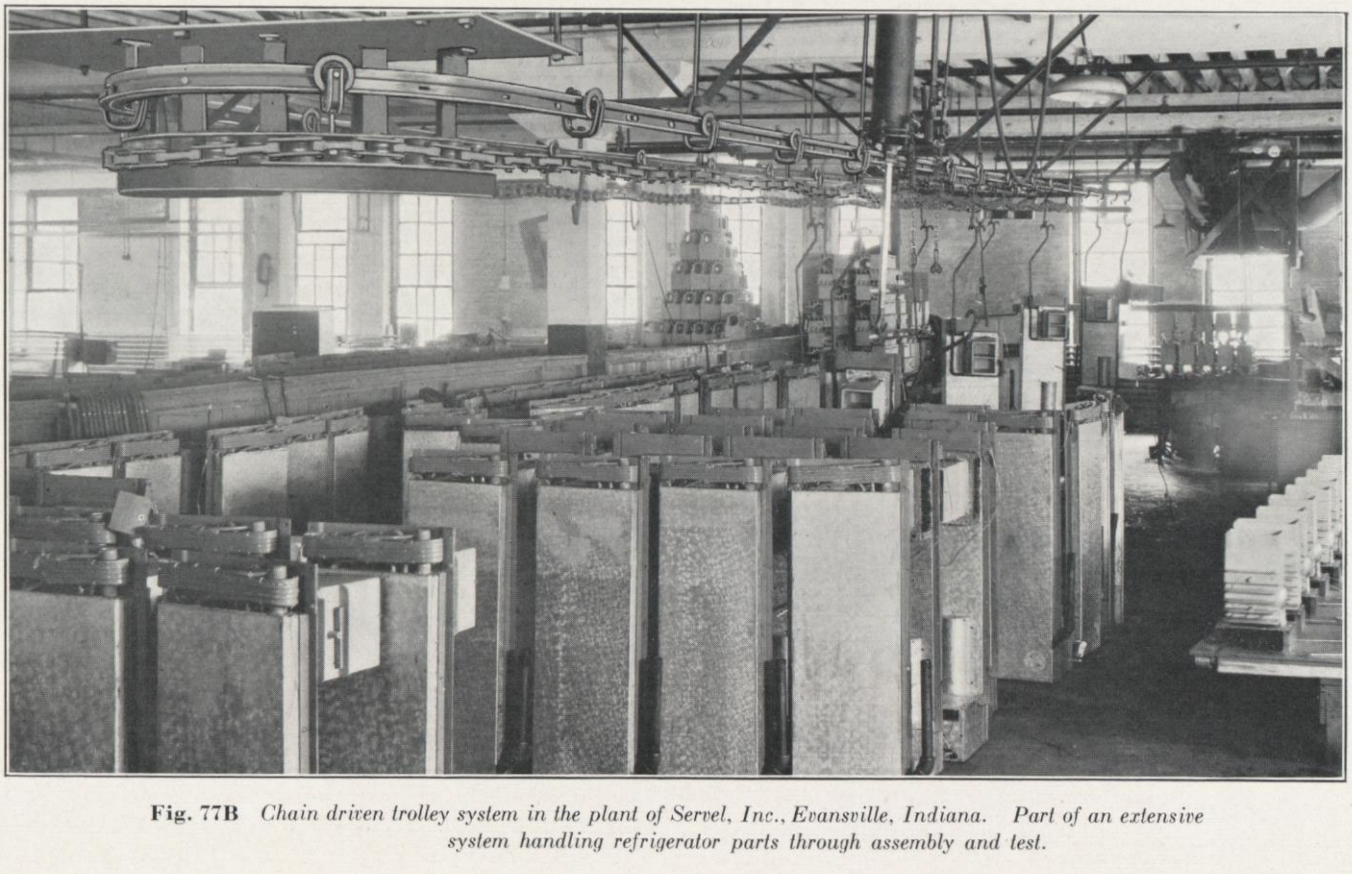


Fig. 77B *Chain driven trolley system in the plant of Servel, Inc., Evansville, Indiana. Part of an extensive system handling refrigerator parts through assembly and test.*

Electrified American MonoRail

PRONOUNCED improvements in the electrification of MonoRail overhead handling systems are mentioned briefly in the outline below, and are illustrated in more detail in connection with various American MonoRail units described on the following pages.

INSULATION

The adoption of ebonite as an insulating material in electrified MonoRail systems is the result of extended research. Ebonite has high dielectric strength—52,500 volts in a 1″ section, and there is no surface leakage even in the presence of oil and atmospheric moisture. It is immune to moisture, and has a high insulation resistance. Ebonite is an ideal material for insulators used under active industrial conditions as it stands shock and vibration without cracking or fracture. It has demonstrated this quality when used as switch panels on U. S. Naval vessels where it has stood the shock of gun fire without injurious effects. Ebonite is a permanent material—no rust, rot or deterioration. It is not harmed by water, oil, gas, or ordinary chemicals.

COMPACTNESS

The close grouping of rigid conductors clamped to the suspension bolts by ebonite insulators permits unusually compact assemblies in switches, turntables, and all other trackage units. For example, it permits the design of electrified switches with only *half the usual switch throw.* This space and cost saving is reflected in every unit, and throughout the entire layout of an American MonoRail system and its supporting superstructure.

ADAPTABILITY

The compactness of the MonoRail system of electrification allows the use of two, three or four conductors. This adapts it to the characteristics of electric current in general use everywhere. It permits the customer to select the proper hoist to serve his purpose, whether he is using Direct Current or Alternating Current in either single or polyphase. Switches may be arranged in most layouts to prevent the reversal of the trolley on the track which would change its phase-relation to the conductors. In those rare cases where for some reason this cannot be done a special convertor will take care of the situation.

SAFETY

Not only are the electrified members held close in, but they are also directly above the rail, minimizing the possibility of accidental contact.

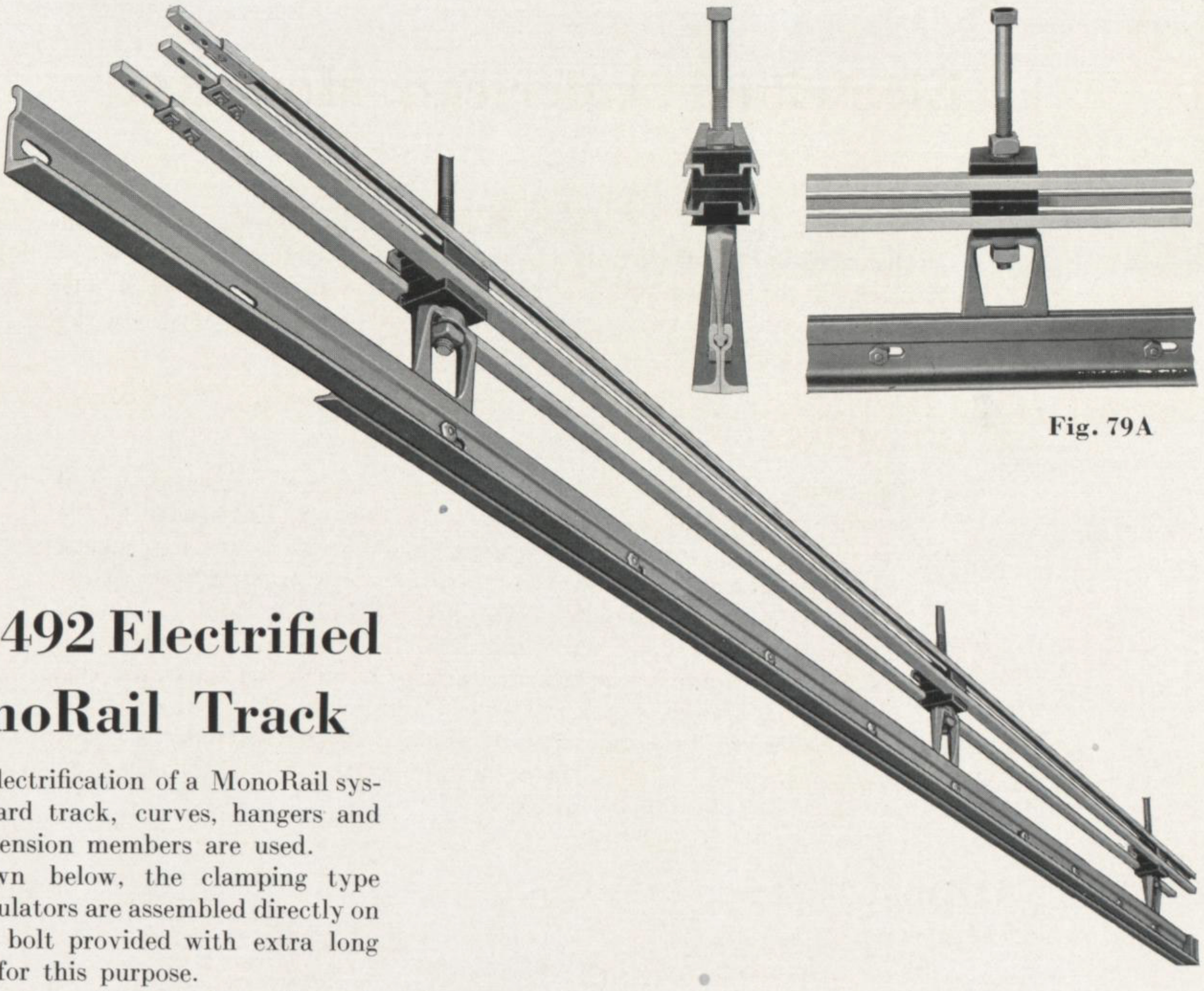


Fig. 79A

No. 492 Electrified MonoRail Track

In the electrification of a MonoRail system standard track, curves, hangers and other suspension members are used.

As shown below, the clamping type ebonite insulators are assembled directly on the hanger bolt provided with extra long threading for this purpose.

The ebonite insulator blocks are formed to the contour of the conductor and are assembled on a bakelite bushing which provides complete insulation from the hanger rod. This insulator assembly is clamped down upon the top of the forged hanger by the use of a jam nut held by a lock washer. The clamping pressure is carried through the conductor bars holding them rigidly in their proper place. These insulators are used at all hanger rods and may be placed at intermediate positions where wider spacing of hangers is permitted by light loads.

The conductor bar is a udylited steel channel section giving sufficient rigidity, and offering ample flat surface for contact with the collector shoe.

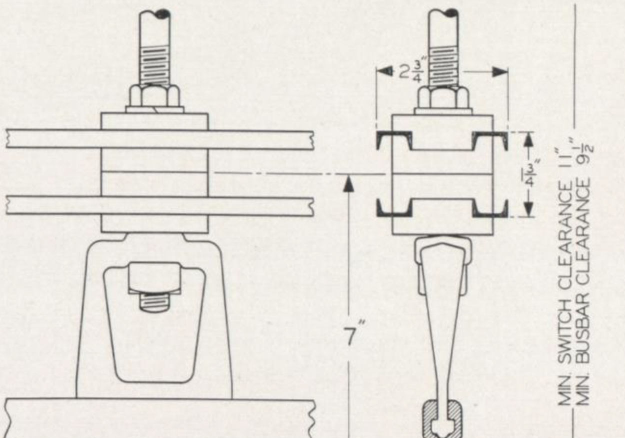


Fig. 79B

Splicing is accomplished by the use of a brass connector bolted inside the channel groove giving full conductivity through the splice.

In electrifying MonoRail curves, the channel-type conductor bars are formed exactly to the radius of the track forming the curves. Conductor bars are mounted on hanger rods as described above for straight track.

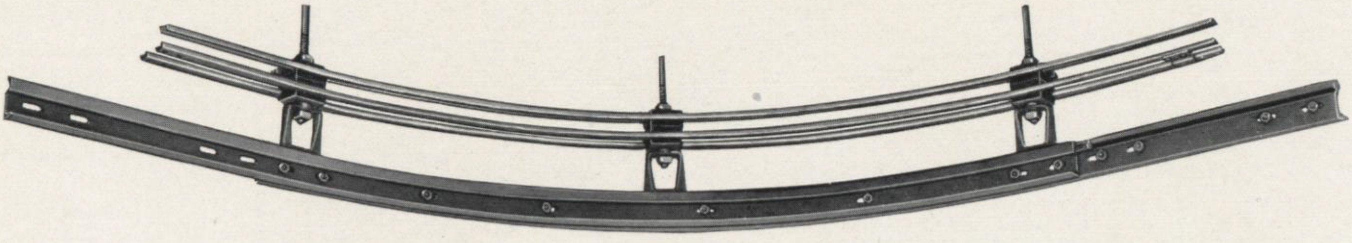
Conductor bars and insulators are shipped knocked-down and must be assembled on the rail as installed. Conductor bars for curves are cut to the exact length required and are wired to the rail on the side of the curve on which they are to be mounted.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings

Electrified MonoRail Curves

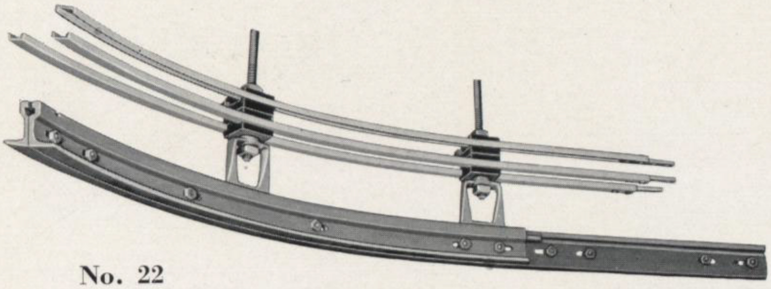
Standard MonoRail curves, corresponding to those in Group G, are used in the electrification of MonoRail systems. These curves are shown on page 21 where dimensions and layout details are given in full.

Conductor bars are bent to the proper radius and length and are shipped wired to the curve, to be mounted in the field. Conductor bars can be bent and formed in the field when necessary. The mounting of conductor bars in curves is identical with that on straight track, details of which are given on the previous page. The splice point on the conductor bars on curves is at the center of the splice in the rail.



No. 21

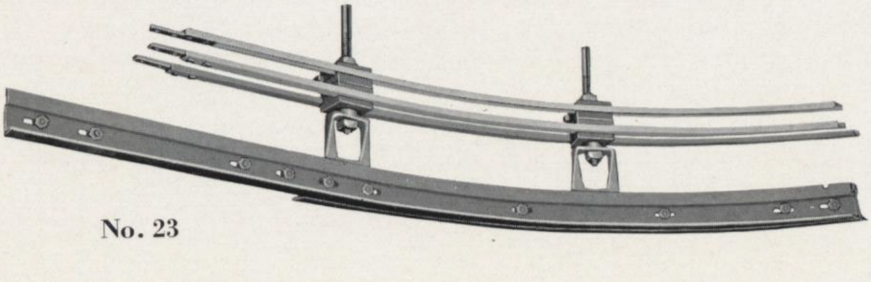
The curve shown above is No. 21, which may be used for either right or left turns in electrified MonoRail track. This curve has a splice on both ends. See Group GA, page 21.



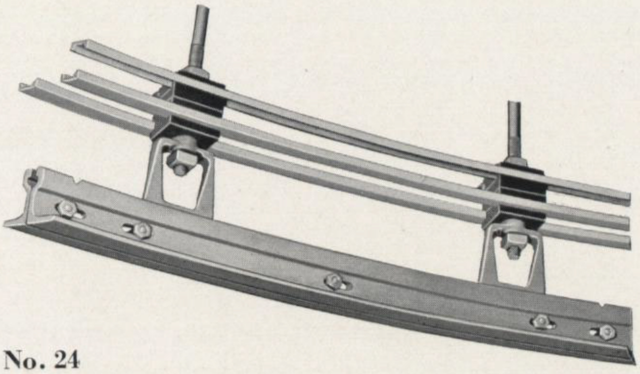
No. 22

The curve on the left, No. 22, is a right hand curve, used for connecting an electrified switch to track running to the right at right angles to the center line of the switch. Has lap splice on one end; the other is beveled for switch connection. See groups, GC, GD or GE, page 21.

No. 23 (right) is a left hand curve used to connect a switch with track running to the left. See groups GB, GD, or GE, page 21.



No. 23



No. 24

No. 24 (left) is a curve which may be used in either right or left hand positions to connect two switches whose center lines are at right angles. See groups GF, GG and following on page 21.

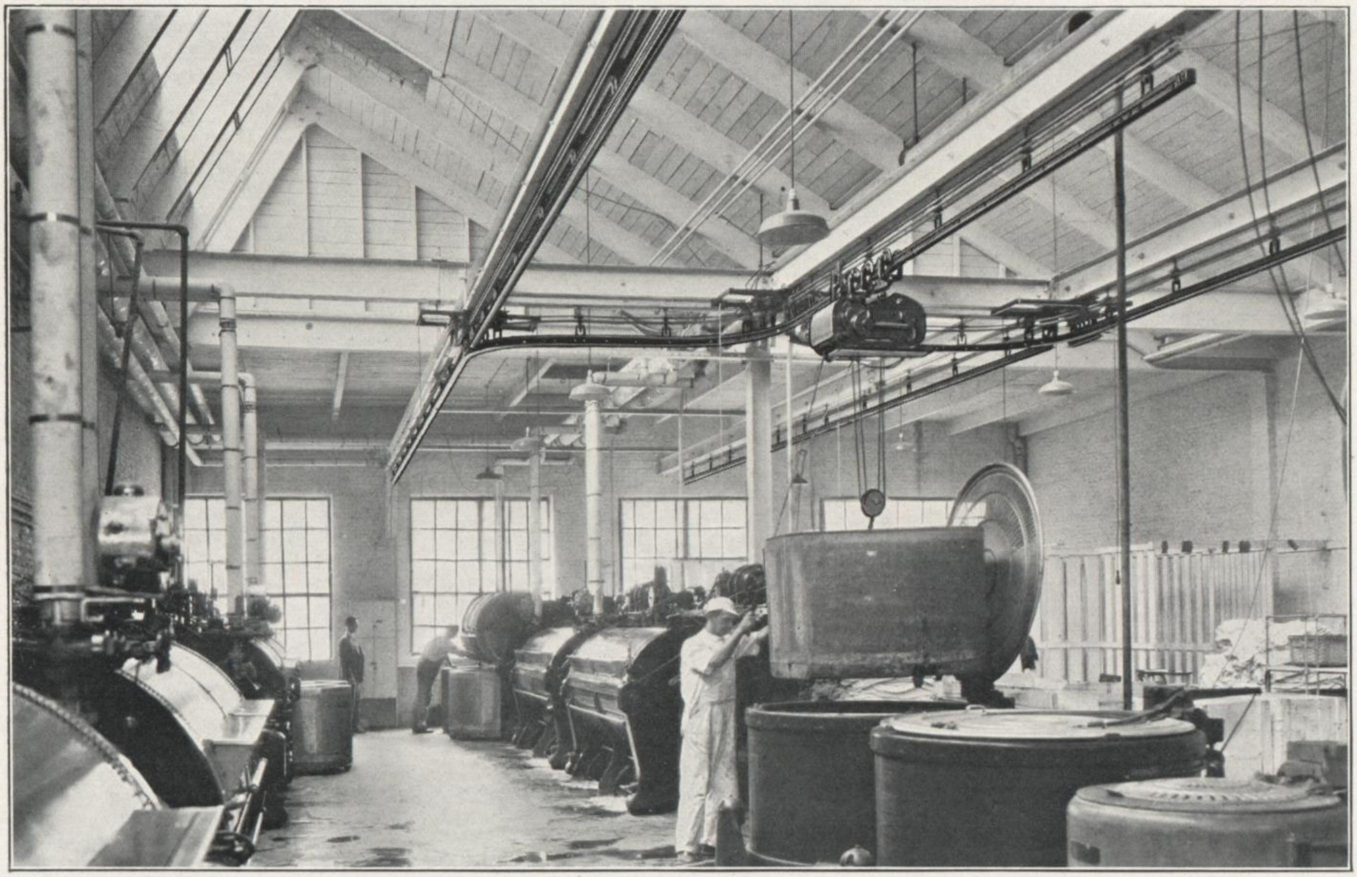


Fig. 81A *Part of electrified MonoRail system in the Fulton Family Laundry, Baltimore, Md. Three electrified switches are in the installation at this point. Operator in foreground is lowering basket into Perry Extractor, using electric hoist.*

Electrified MonoRail Switches

Electrified MonoRail switches are of the glide type and in mechanical construction and operation are in most respects identical with the corresponding non-electrified glide switch.

Electrified switches have the same steel mounting plate, drop forged and rolled steel load carrying members; the same accurate register between shift section and meeting rails; the same positive latch and safety stops as the non-electrified glide type switches. See also the specifications given with each type of switch on the following pages.

In the electrification of MonoRail switches current is carried from the main line to all radiating lines through standard conduit and fittings which follow the main frame from one side of the switch to the other.

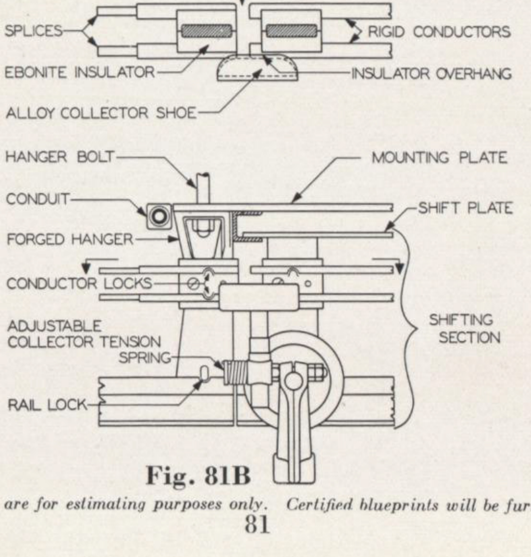


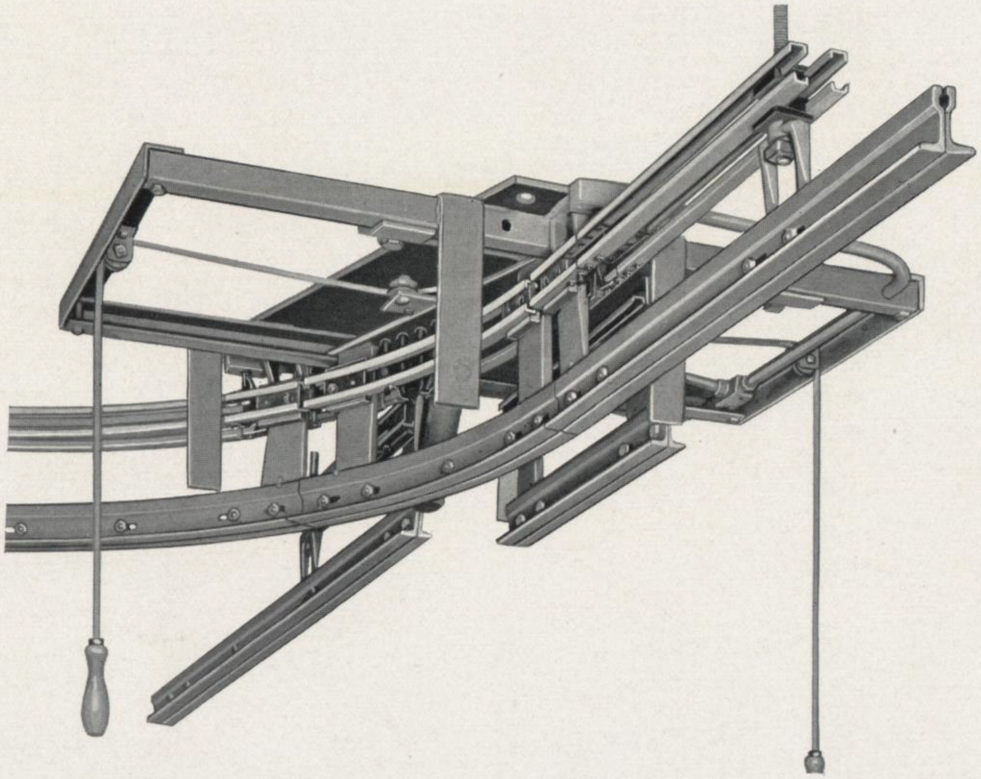
Fig. 81B

No wiring is necessary in erecting the switch as all switches are shipped completely wired and equipped with four conductors. Short lengths of conductor with standard splices are assembled on the switch ready for attachment to conductors on connecting lines of MonoRail.

The shift section of the switch is energized from the main conduit through a commutator set in ebonite and mounted between the switch plates where it is protected from dust, dirt and moisture.

Conductor bars are locked against creepage at the switch brackets. An air gap is maintained at the breaks in the rail to insure against "shorting" when the switch is shifted. The shoe type collectors used on trolleys are of ample length to maintain contact when passing over these air gaps.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 296 Electrified Two-Way Switch

Specifications

Material specifications, and details of construction and operation are identical with those of Glide Type Switch No. 293 described on page 39.

All wiring carried in conduit entire length of switch.

Current carried to shift section by commutator set in ebonite between switch plates.

Conductor bars locked against creepage.

Conductor bars on switch equipped with connectors for meeting tracks.

No wiring necessary in erecting switch.

Weight: 163 pounds.

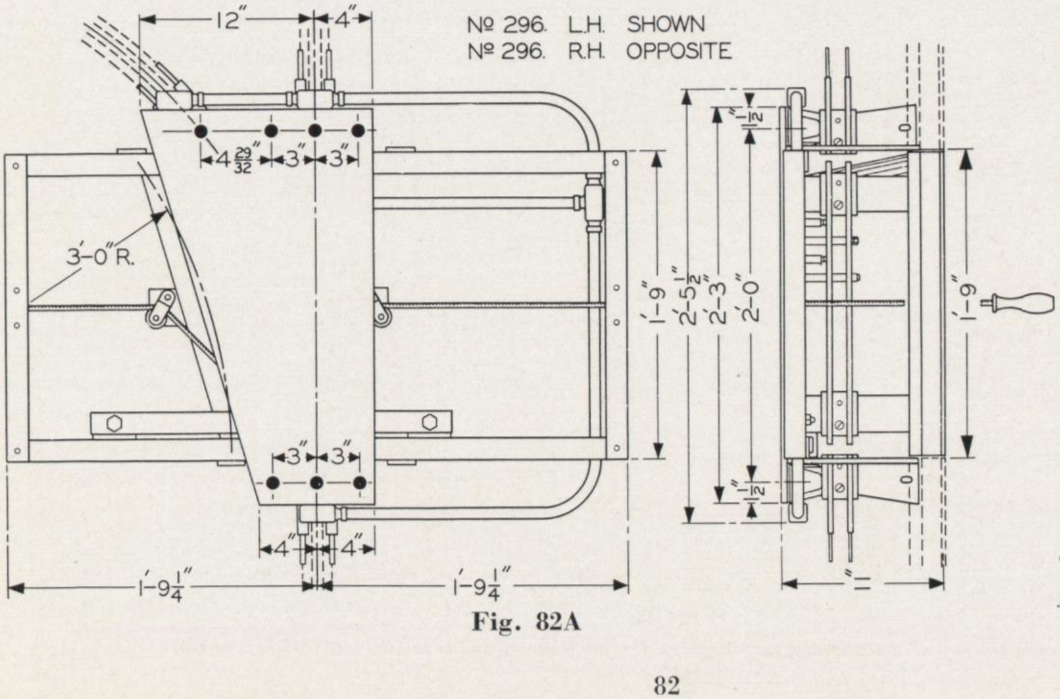


Fig. 82A

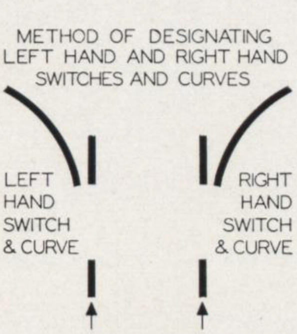
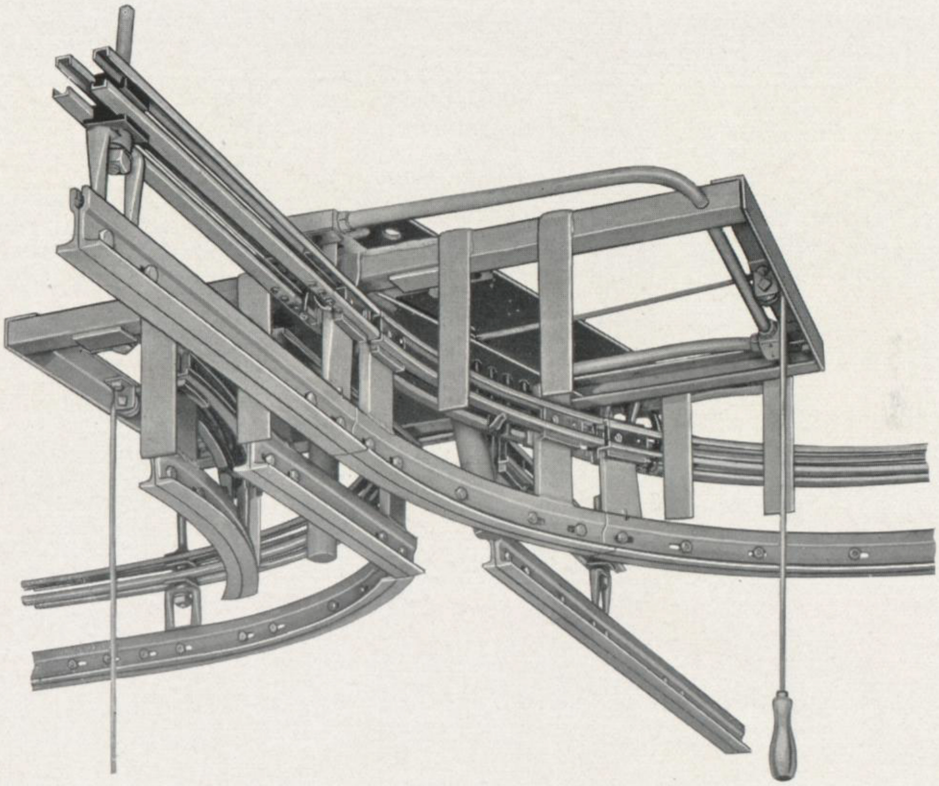

METHOD OF DESIGNATING LEFT HAND AND RIGHT HAND SWITCHES AND CURVES
LEFT HAND SWITCH & CURVE
RIGHT HAND SWITCH & CURVE

Fig. 82B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 297 Electrified Three-Way Switch

Specifications

Material specifications, and details of construction and operation are identical with those of Glide Type Switch No. 294, described on page 41.

All switch wiring carried in standard conduit and fittings.

Shift section energized by commutator set in ebonite between switch plates.

Conductor bars locked against creepage.

Conductor bars on switch equipped with brass connectors.

No soldering or wiring necessary in erecting switches.

Weight: 227 pounds.

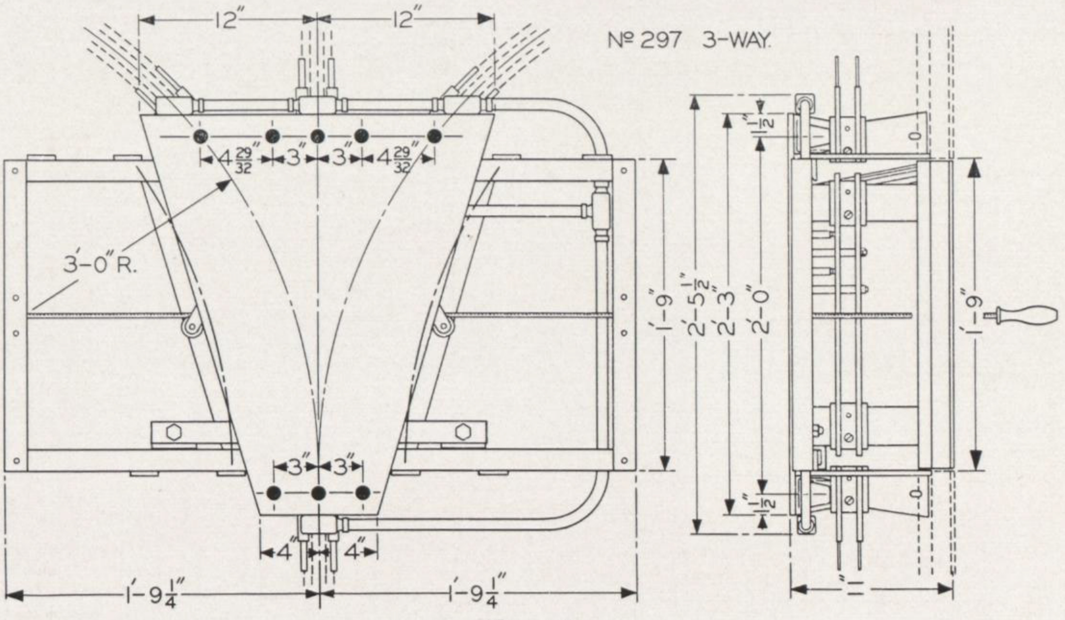
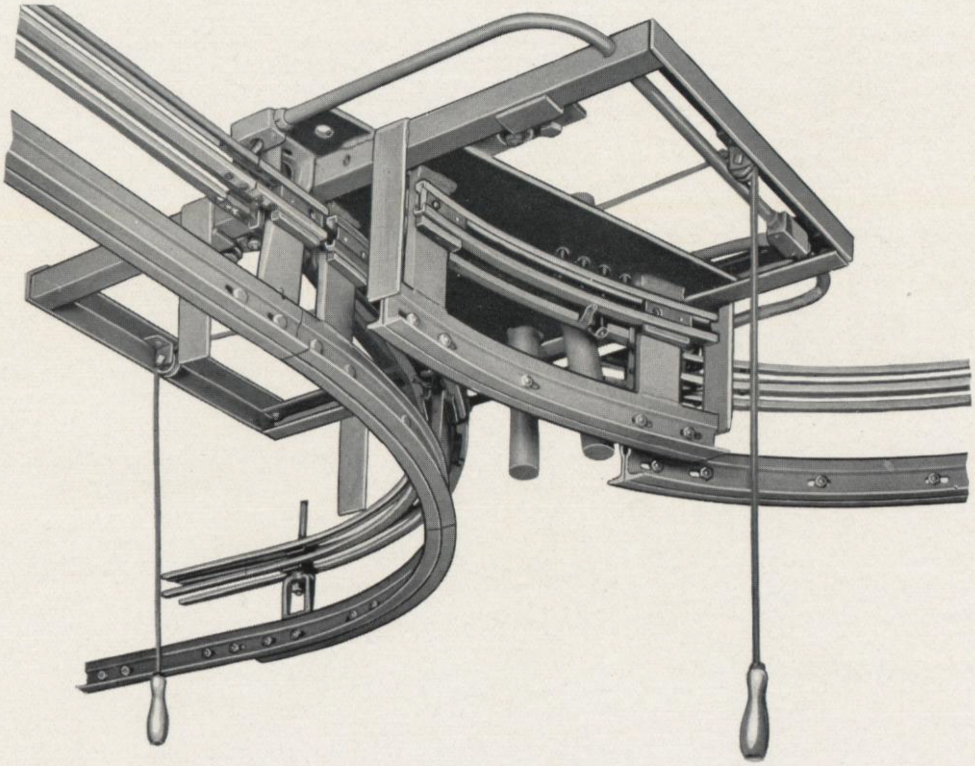


Fig. 83

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 298 Electrified Wye Switch

Specifications

Material specifications, and details of construction and operation are identical with those of Glide Type Switch No. 295, described on page 43.

All switch wiring carried in standard conduit and fittings.

Switches completely wired ready for erection.

Switch conductors connected with track conductors by brass connectors.

Conductor bars locked against creepage.

Shift section energized through commutator set in ebonite between switch plates.

Weight: 181 pounds.

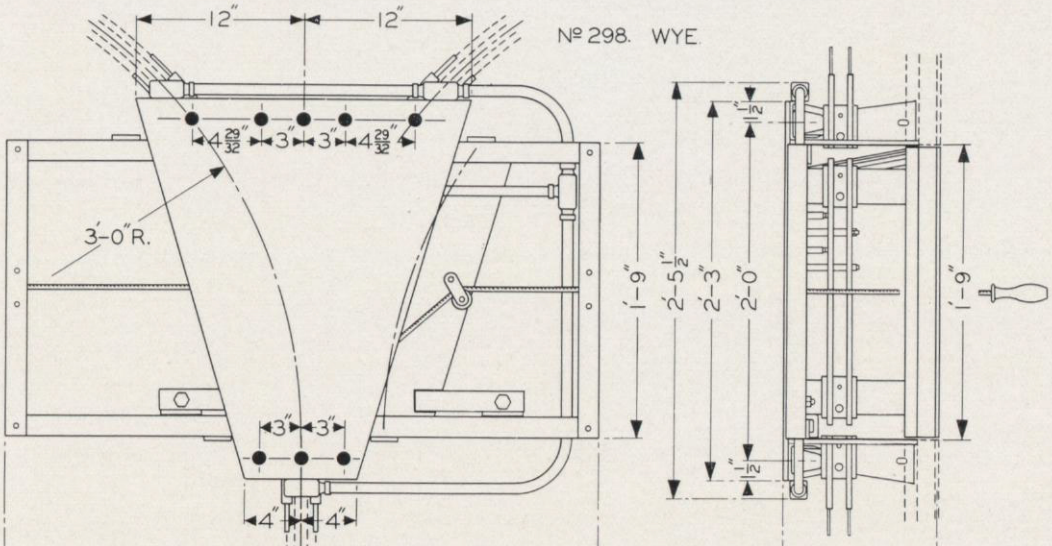
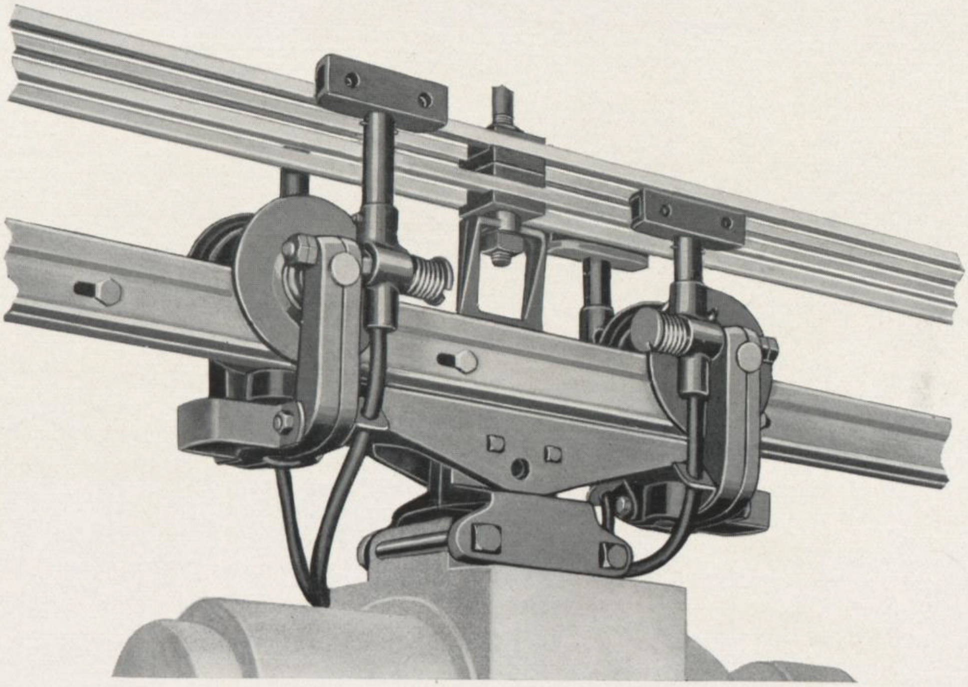


Fig. 84

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



MonoRail Trolley, Electrified

No. 180 Electrified MonoRail Trolleys

American MonoRail current collectors are of hard copper alloy of the shoe type. The contactor shoe is set in a fiber housing which is attached to the top of a fiber tube or shaft through which the wiring is carried.

This tube at its lower end threads into a malleable hinge mounted upon a one-half inch hinge bolt. An adjustable coil spring around the bearing sleeve maintains the proper contact between the shoe and the conductor bar.

Collectors may be mounted on all standard American MonoRail trolleys except No. 188 and No. 189. Each yoke will accommodate two collectors. Each collector is mounted at the top of the trolley yoke to assure that an accurate relation to the conductor bar is maintained when the trolley passes around curves.

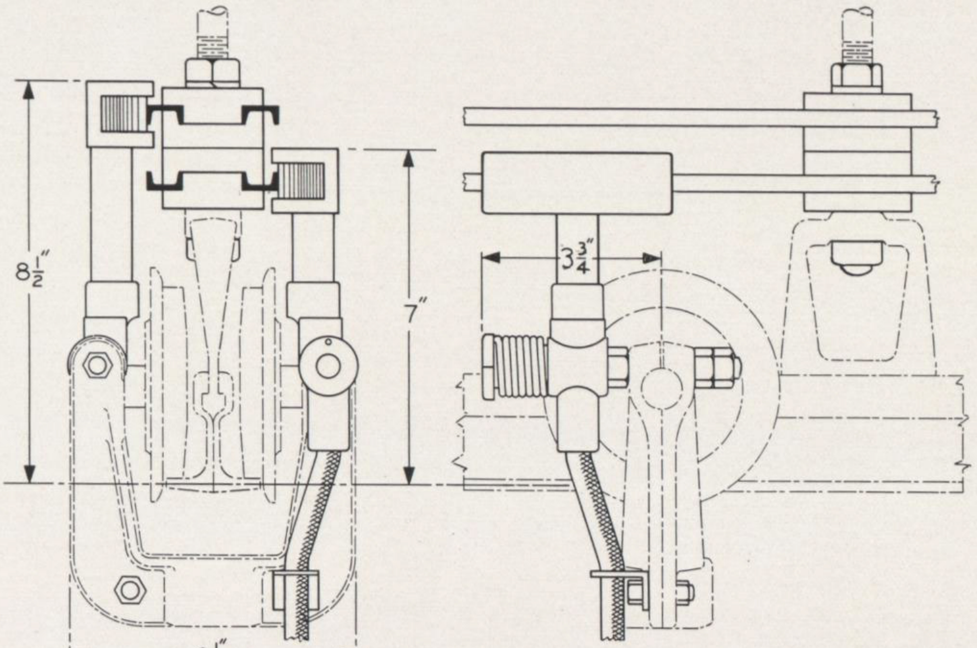
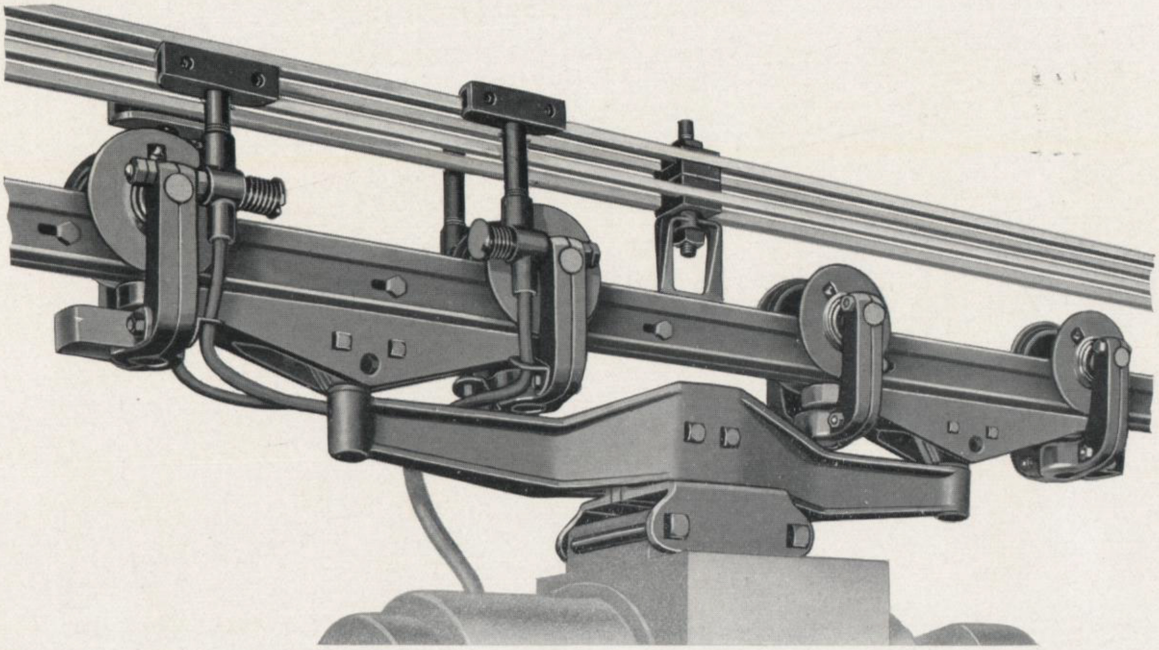


Fig. 85

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



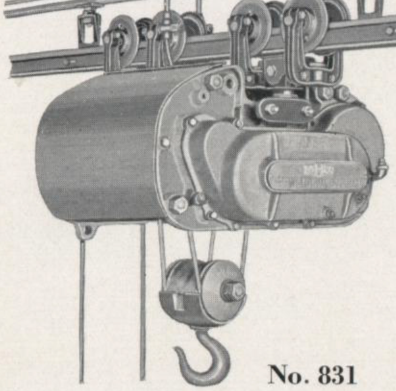
MonoRail Trolley, Electrified

No. 181 MonoRail Trolley Equipment For Hoist Service

On the following pages are shown a number of electric hoists mounted on American MonoRail Trolleys. With each hoist illustration is given a dimensioned drawing and tabulation of typical hoists of each make. This data is given for estimating purposes only. Specific data and blue prints will be furnished for working drawings.

It is a simple matter to connect any make of electric hoist to American MonoRail Trolleys by means of the newly developed adapters shown in the illustration above and on the preceding page.

Lo-Hed Electric Hoist



No. 831

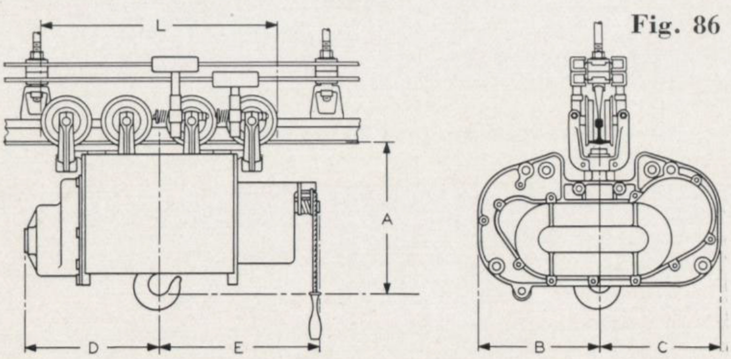
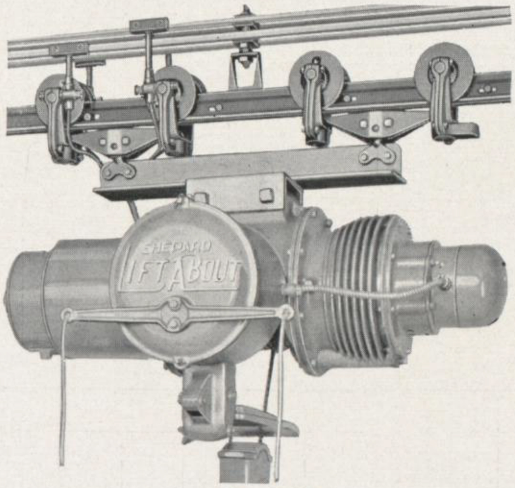


Fig. 86

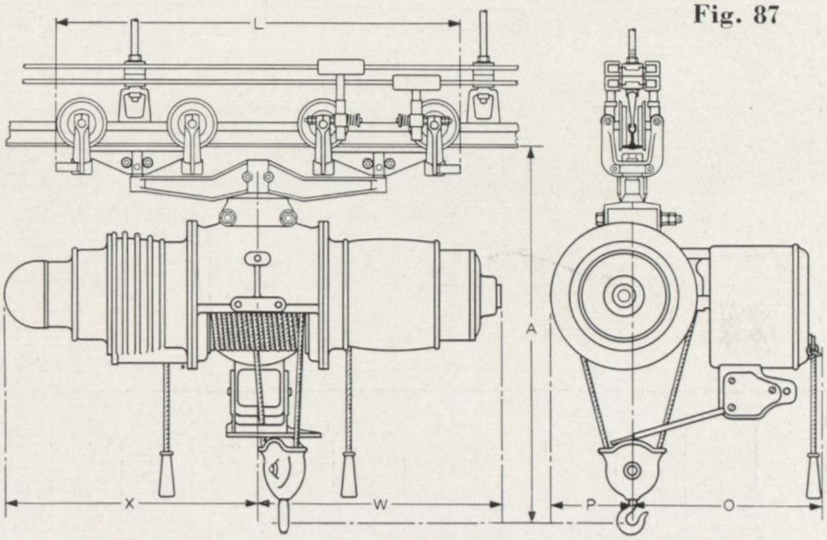
Data in Tabular form on Lo-Hed Electric Hoists is given on opposite page.

Shepard Electric Hoist



No. 830

Fig. 87



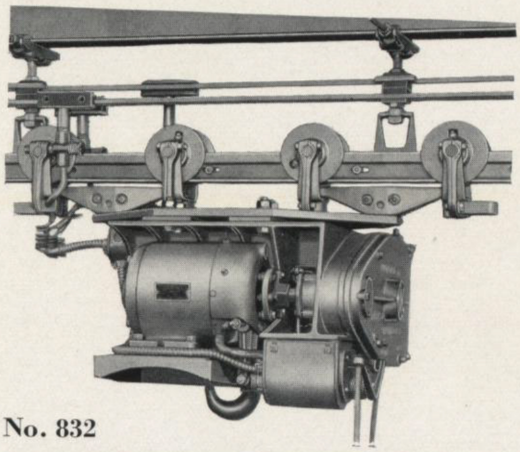
Frame	Form	Capacity	H P of Motor		Lifting Speed		Lift in Ft.	Cable		A	W				X				O	Crated Weight	Trolleys				
										Head Room Rail to Hook	To Front of Hook				To Rear of Hook				Max Side Clearance						
											Single Speed		Var'bl' Speed		Single Speed		Var'bl' Speed								
			DC	AC 60C	DC	AC 60C		Parts	Size		DC	AC 60C	DC	AC 60C	DC	AC 60C	DC	AC 60C			Required	Catalog Number	Length L	Weight	Adapter Or Load Bar
A	1	4000	5	5	22	28	20	2	⅜	44	24	20	24	24	22	24	22	24	22	1075	1	181	53	118	A-229
A	3	4000	5	5	22	28	40	2	⅜	44¾	27¼	23¼	27¼	27¼	25¼	27¼	25¼	27¼	22	1225	1	181	53	118	A-229
G	1-R	500	.75	.75	35	35	17	2	⁵⁄₁₆	30⅛	18	17	18		18	18	18		17	420	1	165	21	39	A-227
G	1-R	1000	.75	.75	20	20	17	2	⁵⁄₁₆	30⅛	18	17	18		18	18	18		17	420	1	162	21	43	A-227
H	1-R	1000	1.5	.15	35	35	15	2	¼	33⅛	21	19	21	21	20	20	20	20	18	770	1	162	21	43	A-227
H	1-R	2000	1.5	.15	20	20	15	2	¼	35⁵⁄₁₆	21	19	21	21	20	20	20	20	18	590	1	171	42	95	A-228
I	1-R	2000	3	3	35	35	17	2	⅜	41³⁄₁₆	25	22	25	25	24	24	24	24	20	770	1	171	42	95	A-228
I	1-R	4000	3	3	20	20	17	2	⅜	41³⁄₁₆	25	22	25	25	24	24	24	24	20	770	1	181	53	118	A-229
G	1-S	500	.75	.75	35	35	30	2	⁵⁄₁₆	30⅛	20	20	20		20	20	20		17	450	1	165	21	39	A-227
G	1-S	1000	.75	.75	20	20	30	2	⁵⁄₁₆	30⅛	20	20	20		20	20	20		17	450	1	162	21	43	A-227
H	1-S	1000	1.5	1.5	35	35	28	2	¼	33⅛	24	22	24	24	22	22	22	22	18	.640	1	162	21	43	A-227
H	1-S	2000	1.5	1.5	20	20	28	2	¼	35⁵⁄₁₆	24	22	24	24	22	22	22	22	18	640	1	171	42	95	A-228
I	1-S	2000	3	3	35	35	30	2	⅜	41¹³⁄₁₆	28	25	28	28	27	27	27	27	20	840	1	171	42	95	A-228
I	1-S	4000	3	3	20	20	30	2	⅜	41¾	28	25	28	28	27	27	27	27	20	840	1	181	53	118	A-229
H	23-S	1000	1.5	1.5	35	35	17	4	⁵⁄₁₆	15⅜	24	22	24	24	22	22	22	22	25¾	765	2	165	43⅛	60	H-891-A
H	23-S	2000	1.5	1.5	20	20	17	4	⁵⁄₁₆	15⅜	24	22	24	24	22	22	22	22	25¾	765	2	162	43⅛	72	H-891-A
I	23-S	2000	3	3	35	35	19	4	¼	19½	28	25	23	28	27	27	27	27	29¼	1010	2	162	48⅝	72	H-891-A
I	23-S	4000	3	3	20	20	19	4	¼	19½	28	25	28	28	27	27	27	27	29¼	1010	2	180	52⅝	80	H-891-A

Lo-Hed Electric Hoist Data. See Illustrations on opposite page.

Class	Capacity	H P Of Motor			Lifting Speed			Lift In Ft	Cable		A	D	E	BC	Weight	TROLLEYS				
		DC	AC 60C	AC 25C	DC	AC 60C	AC 25C		Size	Parts	Head Room	To Rear Of Hook	Front Of Hook	Side Clearance		Req'd	Cat. No	Length L	Weight	Load Bars & Adapters
A½	1000	1	1	¾	20-40	20	17	20	¼	4	15⅜	13	16¼	12	360	2	157	17½	25	A-177 2½x18" Stud Bolts
A½HS	1000	1.6	1.6	1½	40-80	40	34	20	¼	4	15⅜	13	16¼	12	360	2	157	17½	25	A-177
A-1	2000	1.6	1.6	1½	20-40	20	17	20	¼	4	15⅜	13	16¼	12	360	2	162	23½	70	A-177
B-1	2000	3¼	4	3¼	35-70	35	30	20	¼	4	20	19⅝	21⁵⁄₁₆	20⅞	860	2	162	47	108	PH-1772-A
B-1½	3000	3¼	4	3¼	25-50	25	21	20	¼	4	20	19⅝	21⁷⁄₁₆	20⅞	860	2	180	51	117	PH-1772-A
B-2	4000	3¼	4	3¼	20-40	20	17	20	¼	4	20	19⅝	21⁵⁄₁₆	20⅞	900	2	180	51	117	PH-1772-A
H-2	4000	4	4	3¼	25-50	25	21	20	⁵⁄₁₆	4		22⅙	24½	23⅛	1500	2	180	51	117	P-1670-A
L¼	500	¾	¾	⅝	40-80	40	34	20	¼	1	19½	9	8⅛	10⅙	195	2	150	24	38	A-172-A

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Robbins & Myers Electric Hoist



No. 832

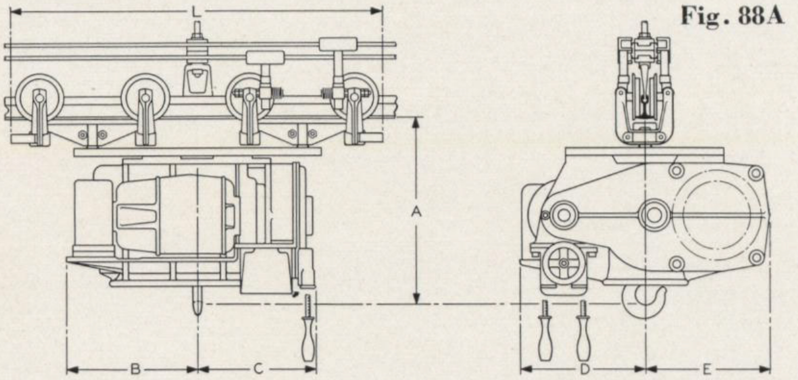
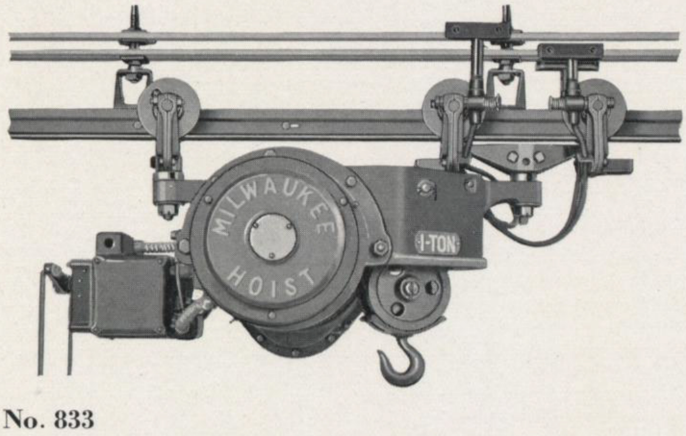


Fig. 88A

Frame	Capacity	H. P. Of Motor	Lifting Speed		Lift In Ft.	Cable		A	B to Rear Of Hook		C	DE	Weight	TROLLEYS				
			AC60C	AC25C		Parts	Size	Head Room	AC60C	AC25C	To Front Of Hook	Max. Side Clearance		Req'd.	Cat. No.	Length L	Weight	Adapter Or Load Bar
S½-L	1000	1	20	24	20	2	¼	15	5⅛	5⅛	11⅜	12	275	2	157	31½	32	By R&M †*
S½-Q	500	1	40	48	40	1	¼	23	8⅛	8⅛	3⅝	12	255	2	150	25¼	28	By R &M †*
S-1	1000	2	50	60	40	2	¼	19½	9½	9½	12¼	13	475	2	165	36	56	By R &M †
S-1	1500	2	25	30	20	4	¼	18½	9½	9½	12¼	13	475	2	165	36	56	By R &M †
S-1-R	2000	2	25	30	20	4	¼	18½	9½	9½	12¼	13	475	2	162	36	60	By R &M †
S-1-S	2000	3	40	48	30	2	⁵⁄₁₆	19½	9½	9½	12¼	13	480	2	162	36	60	By R &M †
S-1	3000	3	25	30	20	4	¼	18½	9½	9½	12¼	13	480	2	180	45	84	By R &M †
S-1	4000	3	20	24	20	4	⁵⁄₁₆	18½	9½	9½	12¼	13	560	2	180	45	84	By R &M †
S-3	3000	5	40	48	40	4	⅜	27½	11¾	11¾	16½	19	1150	2	180	45	84	By R &M †
S-3	4000	5	32	38	30	4	⅜	27½	11¾	11¾	16½	19	1150	2	180	45	84	By R &M †
S½-Q	1000	1	20	24	20	2	¼	20	5⅛	5⅛	5⅛	12	265	2	157	25¼	32	Bv R &M †*

Milwaukee Electric Hoist



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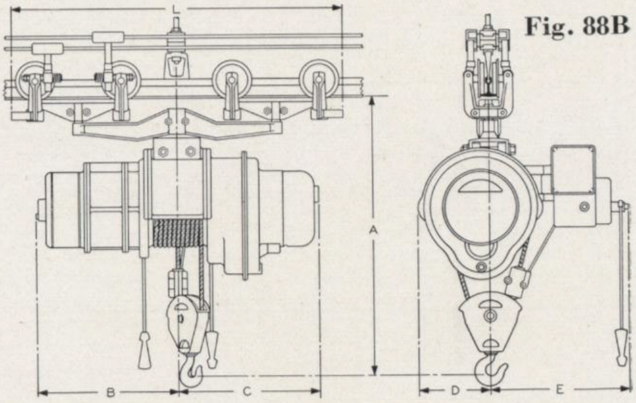


Fig. 88B

Frame	Capacity	H.P. Of Motor			Lifting Speed			Lift In Feet	Cable		A	B Length To Front of Hook			C	E	Hoist Weight	TROLLEYS				
		DC	AC60C	AC25C	DC	AC60C	AC25C		Parts	Size	Head Room	DC	AC60C	AC25C	Rear Of Hook	Side Clearance		Number	Cat. No.	Length L	Weight	Adapter Or Load Bar
R-½	1000	1	1½	1	28	35	28	18	2	¼	28⅝	17¼	14½	14½	17¾	17	325	1	180	21	44	A-227
R-1	2000	2	3	2	28	32	25	18	2	⁵⁄₁₆	35¹⁄₁₆	18¼	15	17	18	17¾	425	1	171	42	95	A-228
R-3	4000	5	7½	5	28	32	25	18	2	⅜	40⅝	22¾	19	21¾	21	20¼	765	1	181	51	118	A-229
LR-½	1000	1	1½	1	28	35	28	36	2	¼	28⅝	20¼	17½	17½	20¾	17	410	1	180	21	44	A-227
LR-1	2000	2	3	2	28	32	25	36	2	⁵⁄₁₆	35¹⁄₁₆	21½	18¼	20¼	21¾	17¾	540	1	171	42	95	A-228
LR-3	4000	5	7½	5	28	32	25	36	2	⅜	40⅝	26	22½	25	24¼	20¼	850	1	181	51	118	A-229
HR-½	1000	1	1	1	28	20	28	15	4	³⁄₁₆	12¾	24½	24½	24½	11¼	20¾	440	2	165	43	60	A-219-A
HR-1	2000	2	2	2	28	20	25	15	4	¼	14¾	26¾	26¾	26¾	11½	21¾	570	2	162	45	72	A-219-A
HR-3	4000	5	5	5	28	20	25	15	4	⁵⁄₁₆	17¾	30¾	30¾	30¾	14¼	26	930	1 1	171 180	70	139	A-219-A
R½	2000	1	1½	1	14	17	14	.9	4	¼	38¹⁄₁₆	17¼	14½	14½	17¾	17	360	1	171	42	95	A-228orA-227
R-1	4000	2	3	2	14	16	12	9	4	⁵⁄₁₆	43⅞	18¼	15	17	18	17¾	465	1	181	51	118	Plate & Filler

* Are Mounted Across the line. All others parallel. NOTE: Above Figures For *A.* C. Only. D. C. Information will be Furnished On Request.
Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Wright Electric Hoist

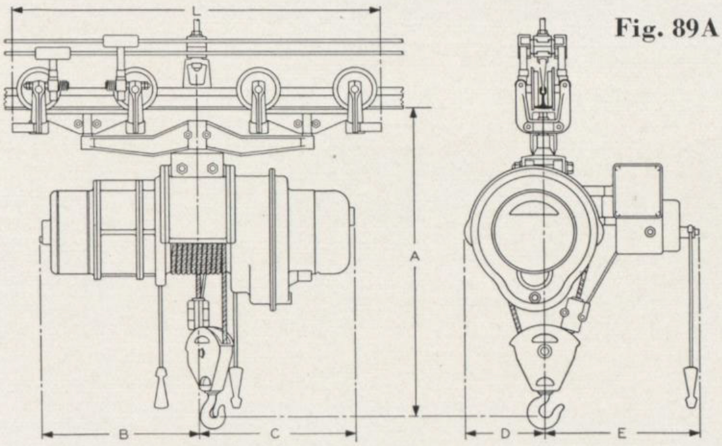
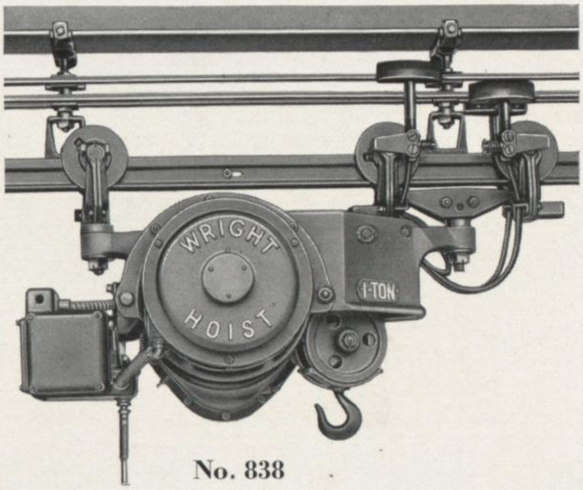


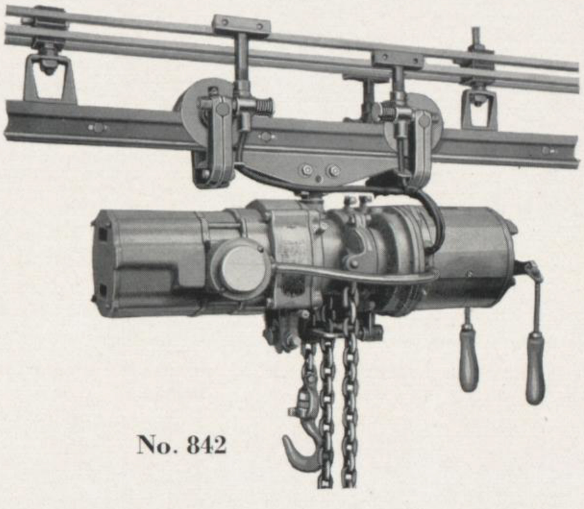
Fig. 89A



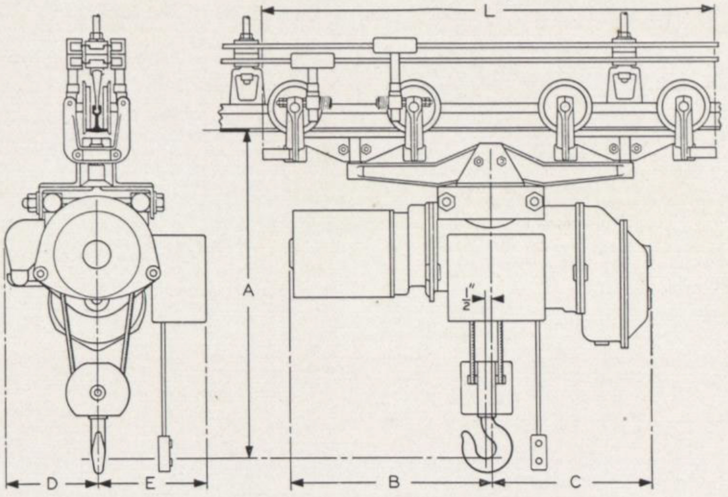
No. 838

Frame	Capacity	H. P. Of Motor			Lifting Speed			Lift in Ft.	Cable		A	B Length To Rear of Hook			C	E	Max. Weight	TROLLEYS				
		DC	AC 60C	AC 25C	DC	AC 60C	AC 25C		Parts	Size	Head Room	DC	AC 60C	AC 25C	Front OF Hook	Max. Side Clearance		Number	Cat. No.	Length L	Weight	Adapters Req'd.
W-½	1000	1	1½	1	28	35	28	18	2	¼	28⅝	17¼	14½	14½	17	17	340	1	180	21	44	A-227
W-1	2000	2	3	2	28	32	25	18	2	5/16	35 1/16	18¼	15	17	18	17¾	445	1	171	42	95	A-228
W-3	4000	5	7½	5	28	32	25	18	2	⅜	40⅝	22¾	19	21¾	22½	20¼	795	1	181	51	118	A-229
WL-½	1000	1	1½	1	28	35	28	36	2	¼	28⅝	20¼	17½	17½	20	17	425	1	180	21	44	A-227
WL-1	2000	2	3	2	28	32	25	36	2	5/16	35 1/16	21½	18¼	20¼	21¾	17¾	560	1	171	42	95	A-228
WL-3	4000	5	7½	5	28	32	25	36	2	⅜	40⅝	26	22½	25	25¾	20¼	880	1	181	51	118	A-229
WH-½	1000	1	1	1	28	20	28	18	4	3/16	12¾	24½	24½	24½	11¼	20¼	455	2	165	43	60	A-219-A
WH-1	2000	2	2	2	28	20	25	18	4	¼	14¾	26¾	26¾	26¾	11½	21½	590	2	162	45	72	A-219-A
WH-3	4000	5	5	5	28	20	25	18	4	5/16	17¾	30¾	30¾	30¾	14¼	26	960	1	171	70	139	A-219-A
																		1	180			
W-½	2000	1	1½	1	14	17	14	9	4	¼	38 1/16	17¼	14½	14½	17	17	375	1	171	42	95	A-228 or 227
W-1	4000	2	3	2	14	16	12	9	4	5/16	43⅞	18¼	15	17	18	17¾	485	1	181	51	118	Plate & Filler

Chisholm-Moore Electric Hoist (Chain) Fig. 89B



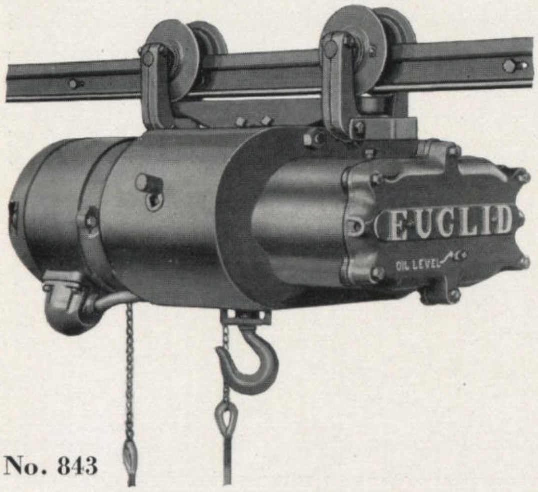
No. 842



CLASS & Frame	Capacity	H. P. Of Motor	Lifting Speed	Lift Ft.	Cable		A	B	C	E	Hoist Weight	TROLLEYS				
					Parts	Size	Head Room	Hook To Rear	Hook To Front	Max Side Clear'nce		Req'd.	Cat. No.	Length L	Weight	Adapter Load Bar
H1-UP	500	¾-1¼	40-60	25	2	3/16	17⅝	18½	15	11	262	2	150	22	64	H-879
H1-UP	1000	¾-1¼	20-30	12½	4	3/16	23⅛	18½	15	11	278	2	165	39	96	H-879
H1-UP	1000	1½	40	12	2	¼	17⅞	18½	15	11	270	2	165	39	96	H-879
H1-UP	2000	1½	20	10½	4	¼	24⅛	18½	15	11	286	2	162	39	108	H-879
Chain	1000	¾	20	*9	Chain		18⅛	15	16⅛	9	220	1	165	17	30	
Chain	2000	1	14	*9	Chain		24 1/16	15½	17¾	11½	275	1	171	42	81	
Chain	4000	1½	10	*9	Chain		37¼	15½	17¾	10⅝	330	1	181	51	106	

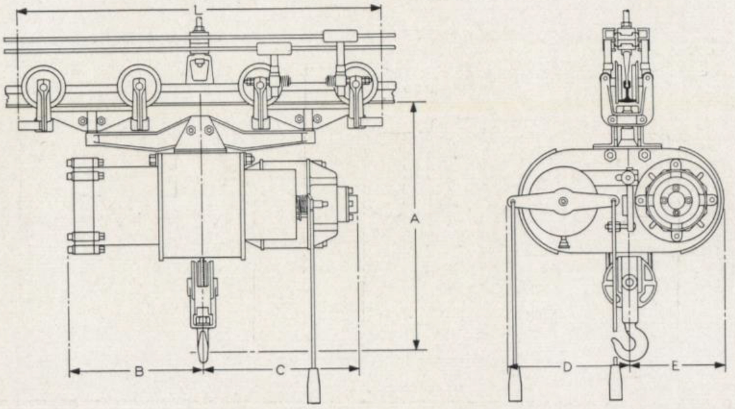
*NOTE: Load Chains Can Be Furnished In Any Lengths.

Euclid Electric Hoist



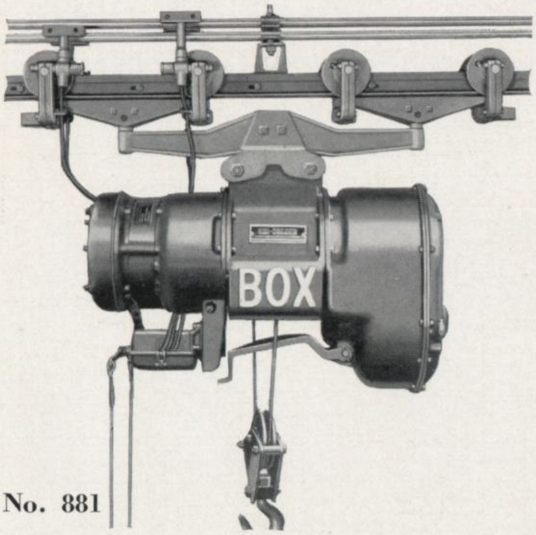
No. 843

Fig. 90A



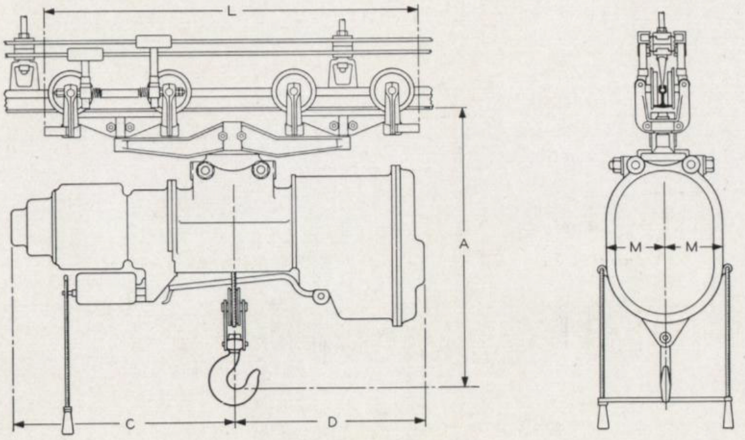
Type & Number	Capacity	Lift in Feet	Lifting Speed	A Head Room	B To Rear of Hook	C To Front of Hook	Cable		Hoist Weight	D Max. Side Clearance	Trolleys				
							Parts	Size			Req'd	Cat. Number	Length L	Weight	Adapter or Load Bar
11-D	1000	15	27	17¼	18	14	2	¼		14	1	180	21	52	H-880-B
11-D	1500	15	27	17¼	18	14	2	¼		14	1	180	21	52	H-880-B
12-E	2000	15	30	20	18	15½	2	5/16	378	14	1	171	42	93	H-880-B
12-E	3000	15	30	20	18	15½	2	5/16	378	14	1	181	51	118	H-880-B

Box Electric Hoist



No. 881

Fig. 90B

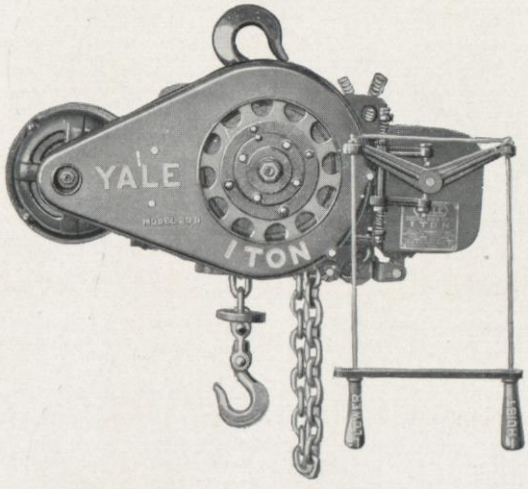


Frame	Capacity	Lifting Speed			Lift in Feet	Cable		A Head Room	C To Rear Of Hook	D Front Of Hook	M Max. Side Clearance	Hoist Weight	Trolleys				
		D. C.	A. C. 60C	A. C. 25C		Parts	Size						Req'd	Cat. No.	Length L	Weight	Connector or Load Bar
LL-¼	500	42	42	25	*15	1	5/16	23¾	16½	12⅞	6½	335	1	180	1'-9''	47	A-227
LL-½	1000	21	21	13	**15	2	5/16	27½	16½	12⅞	6½	335	1	175	3'-6''	100	H-877
LL-1	2000	29	29	18	20	2	5/16	26¾	17¾	15½	6½	420	1	171	3'-6''	108	H-877
LRS-1	2000	30	26	16	40	2	5/16	28¼	24''	21¼	7½	705	1	171	3'-6''	108	H-877
LR-1½	3000	30	26	16	20	2	5/16	28¼	20''	17¼	7½	710	1	181	4'-3''	133	H-877
LRS-1½	3000	30	26	16	40	2	5/16	28¼	24''	21¼	7½	840	1	181	4'-3''	133	H-877
LR-2	4000	30	26	16	18	2	⅜	31¾	20''	17¼	7½	800	1	181	4'-3''	133	H-877
LRS-2	4000	30	26	16	36	2	⅜	31¾	24''	17¼	7½	880	1	181	4'-3''	133	H-877

* Max. Lift. LL¼—60 Ft.
** Max. Lift. LL½—30 Ft.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Yale Electric Hoist (Chain)



No. 882

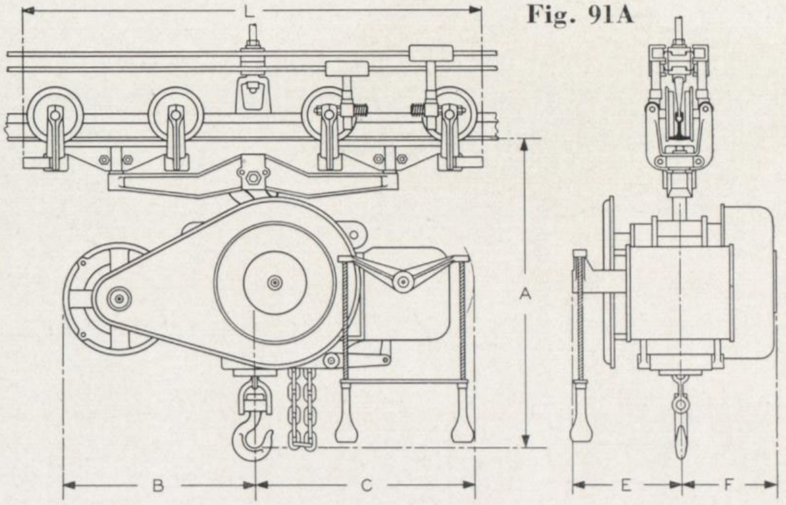
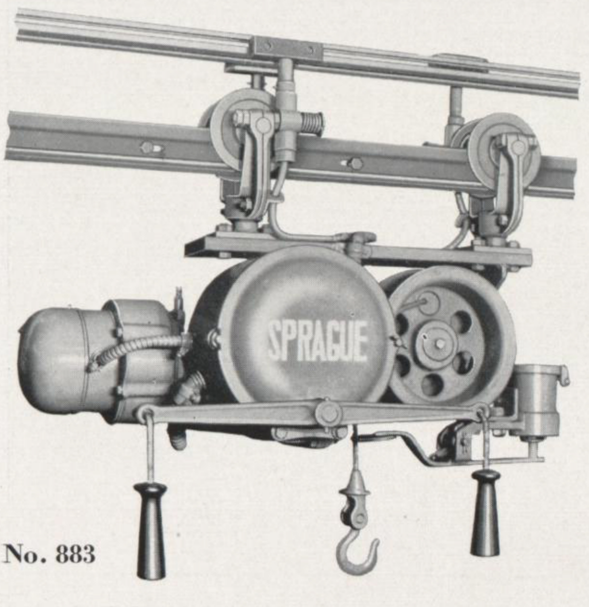


Fig. 91A

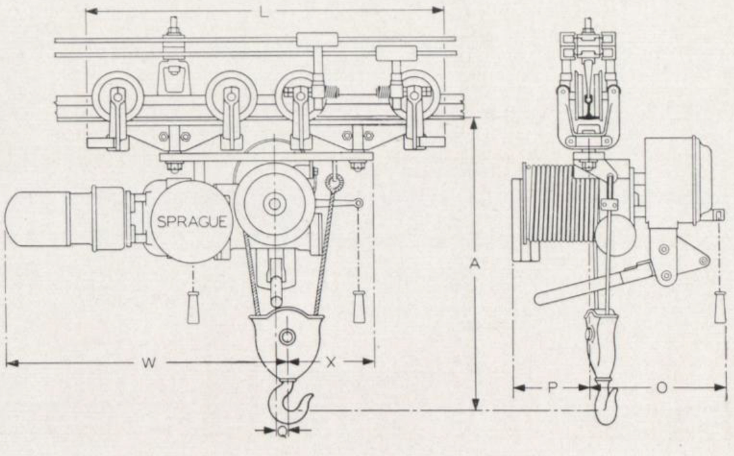
Capacity	H. P. of Motor	Lifting Speeds			Lowering Speed			Lift in Feet	A	B	C	E	Weight Of Hoist	Trolleys			
		DC	AC		DC	AC			Head Room	To Rear Of Hook	To Front Of Kook	Max. Side Clearance		Req'd.	Cat. No.	Length L	Weight
			Poly-Phase	Single		Poly-Phase	Single										
¼ Q S	¾	36	32	40	56	34	66	10	21⅞	15½	18¾	8⅝	250	1	165	17	24
½	¾	18	16	20	28	17	33	10	21⅞	15½	18¾	8⅝	250	1	165	17	24
½ Q S	1½	32	35	32	45	38	45	10	21⅞	17⅜	20⅛	9⅞	250	1	165	17	24
½ H S	2¼		50			55		10	21⅞	17⅜	20⅛	9⅞	250	1	165	17	24
1 L S	1½		6			7		10	28 1/16	17⅜	20⅛	9⅞	410	1	171	42	75
1	1½	20	18	17	30	19	28	10	28 1/16	17⅜	20⅛	9⅞	410	1	171	42	75
1 Q S	2¼	29	26		29	29		10	28 1/16	17⅜	20⅛	9⅞	410	1	171	42	75
2 L S	1½		3			3½		10	36¼	16	21½	9⅞	475	1	181	51	100
2	1½	10	9	8.5	10	9.5	14	10	36¼	16	21½	9⅞	475	1	181	51	100
2 Q S	2¼	15	13		15	14		10	36¼	16	21½	9⅞	475	1	181	51	100



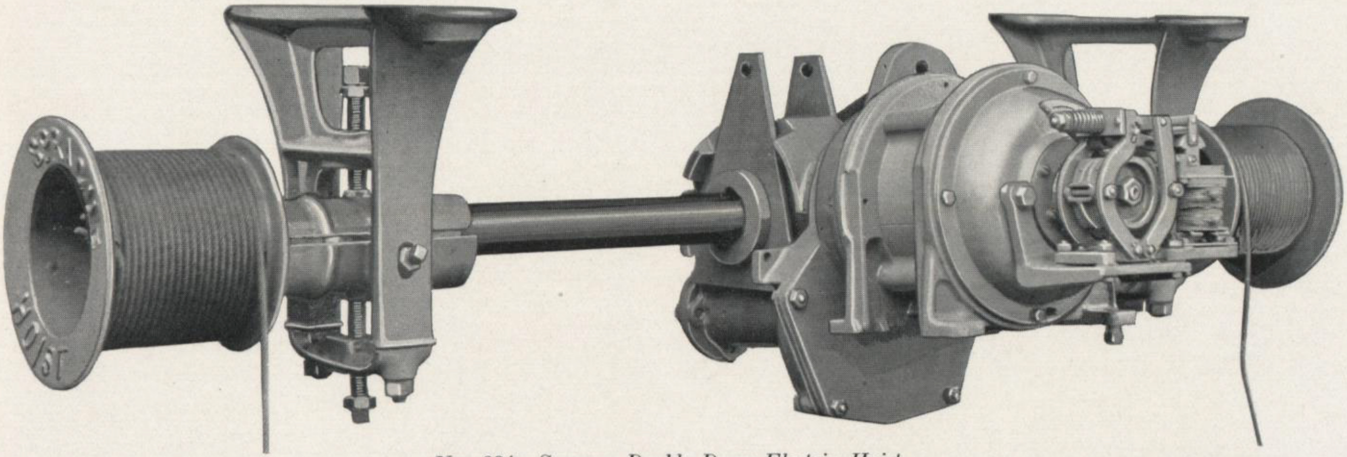
No. 883

Sprague Electric Hoist

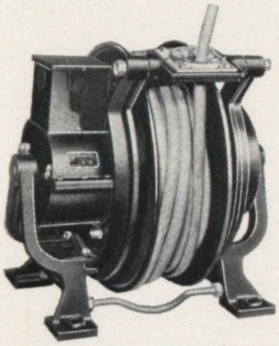
Fig. 91B



Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

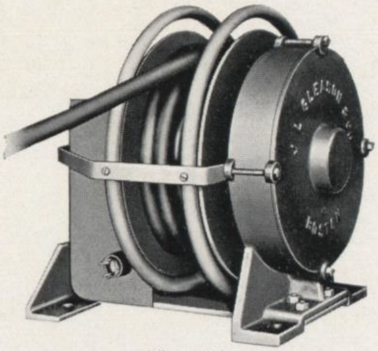


No. 884 *Sprague Double Drum Electric Hoist.*



No. 885
Reelite, Manufactured by the Appleton Electric Co.

For situations where electric hoist operation on MonoRail Cranes is desired, and standard electrification cannot be used or is not wanted, one of the devices shown here may be used to feed out or take up the cable conducting current to the hoist.



No. 886
The Gleason Reel. Manufactured by J. L. Gleason & Co.

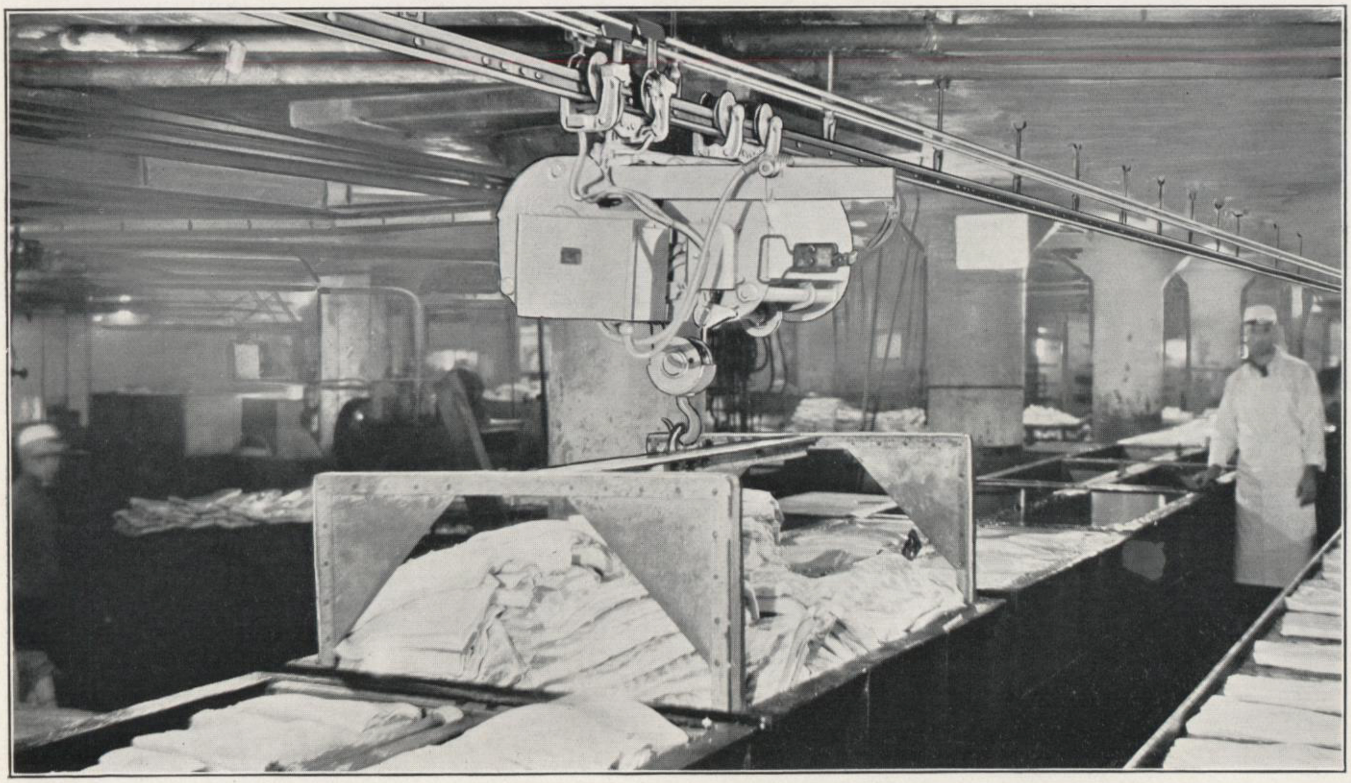
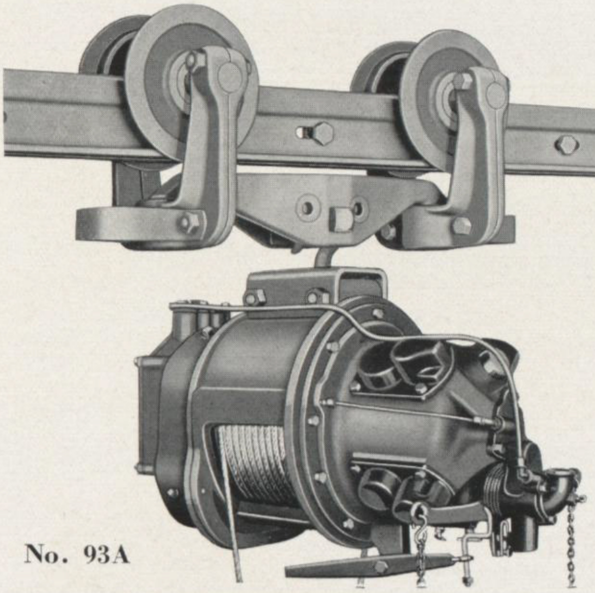
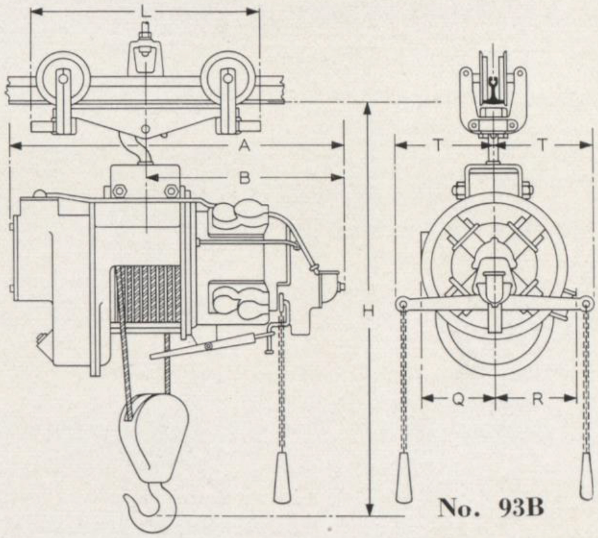


Fig. 92D *Electrified MonoRail System in the plant of John Morrell & Co., Inc., Ottumwa, Iowa, handling bacon slabs through the pickling process.*

Chicago Pneumatic Air Hoist



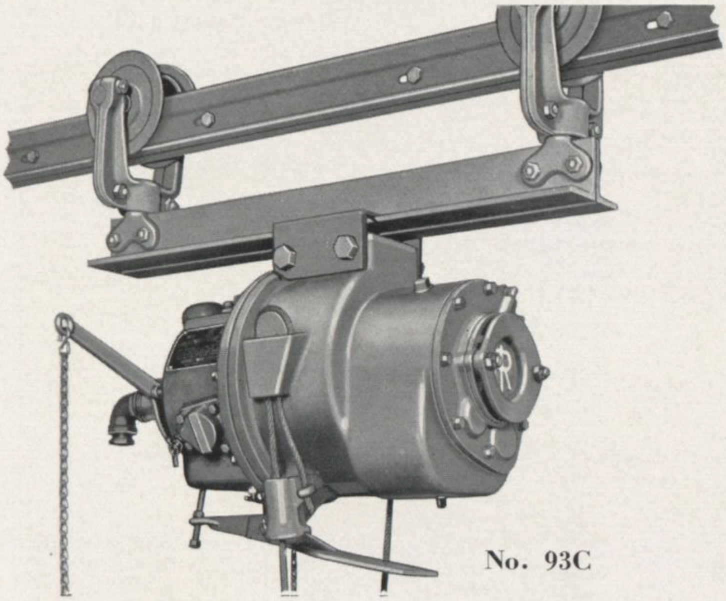
No. 93A



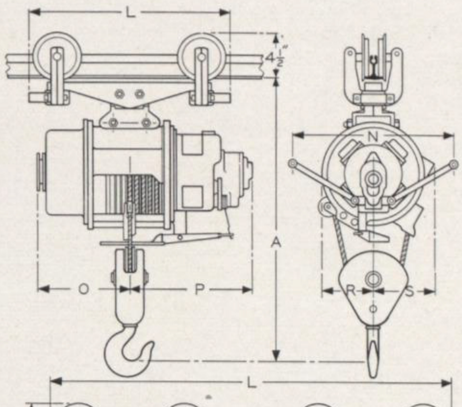
No. 93B

Capacity	Lift in Feet	Lifting Speed at 100 lb. Pressure	Lowering Speed at 100 lb. Pressure	A-B To Rear Of Hook	B To Front of Hook	T Max. Side Clearance	Cable Length	Cable Size	Weight	Trolleys Req'd.	Trolleys Catalog Number	Trolleys Length L	Trolleys Hook Head Room	Trolleys Hook Weight	Trolleys Adapter Head Room	Trolleys Adapter Weight	Adapter or Load Bar
500	15	85	116	8 5/8	17 7/16	9	36	1/4	216	1	165	17	30 1/4	24	28 1/4	38	A-228
1000	15	50	73	8 5/8	17 7/16	9	36	1/4	217	1	162	17	30 1/4	24	28 1/4	38	A-228
2000	15	42	68	12 1/2	18	9	36	5/16	375	1	171	42	41 15/16	75	36 7/16	89	A-228
3000	15	31.5	75	13 11/16	19 15/16	9	36	3/8	502	1	181	51	45 1/4	100	37 5/8	114	A-229
4000	15	21	44	13 11/16	19 15/16	9	36	3/8	505	1	181	51	45 1/4	100	37 5/8	114	A-229

Ingersoll-Rand Air Hoist



No. 93C



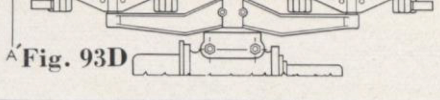


Fig. 93D

Frame	Type	Capacity	Lift in Feet	Cable Parts	Cable Size	A Head Room	O Rear of Hook	P Front of Hook	N/2 Max. Side Clearance	Weight	Trolleys Req'd.	Trolleys Cat. No.	Trolleys Length L	Trolleys Weight	Trolleys Adapter or Load Bar
A	Rope	500	15	2	1/4	29 1/4	9 11/16	12 3/4	8 1/2	145	1	165	17	32	A-227
AC	Chain	500	8	1		22 5/8	9 1/2	12 15/16	8 1/2	135	1	165	17	32	A-227
B	Rope	1000	15	2	1/4	29 1/4	9 11/16	12 3/4	8 1/2	145	1	162	17	37	A-227
BC	Chain	1000	8	1		22 5/8	9 1/2	12 15/16	8 1/2	135	1	162	17	37	A-227
C	Rope	2000	15	2	5/16	35 9/16	12 1/16	15 9/16	8 13/16	325	1	171	42	89	A-228
D	Rope	4000	18	2	3/8	40 3/4	14 3/4	16 3/8	8 13/16	445	1	181	51	110	A-229

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

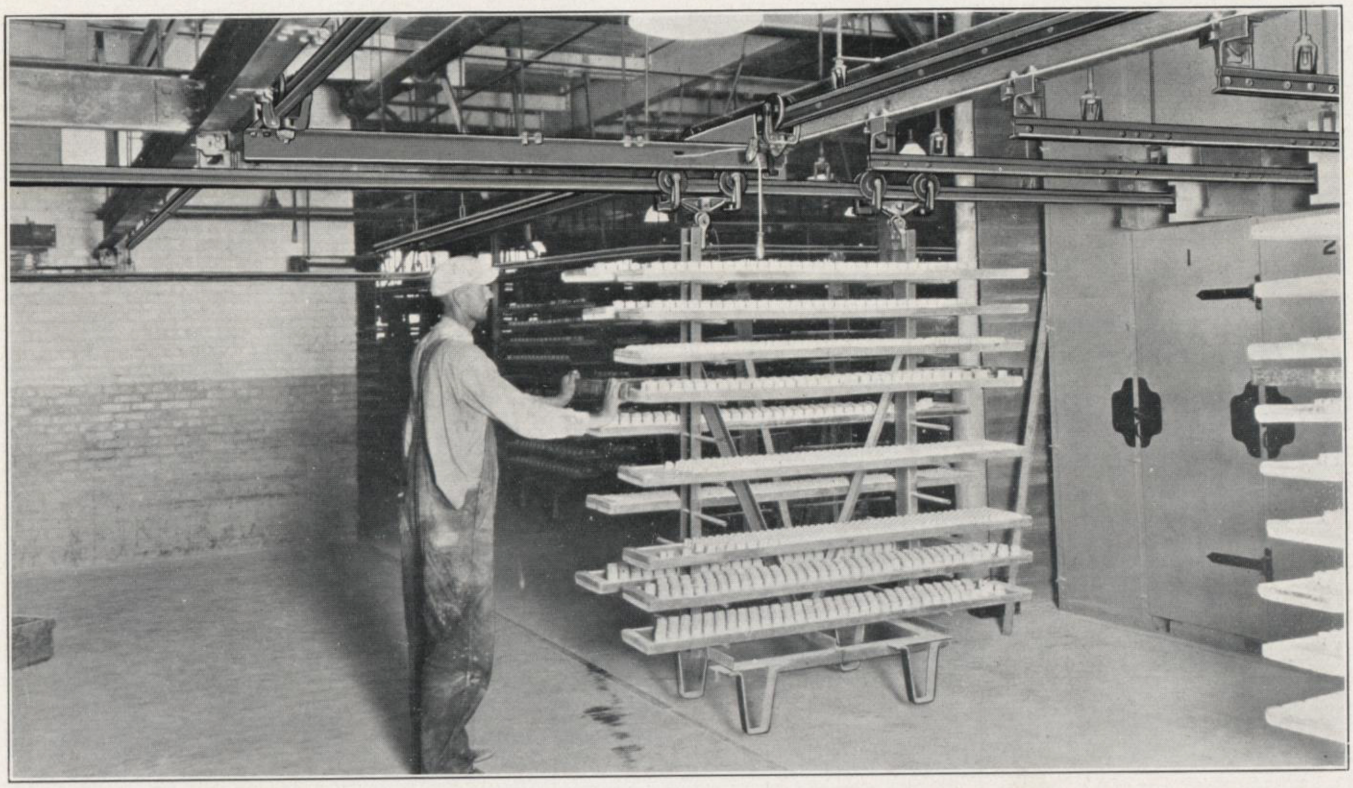


Fig. 94A *Transfer crane with interlocking connection with approaching tracks in plant of the Washington Porcelain Co., Washington, N. J. Note also dryer doors fitting around MonoRail track providing heat-retaining closure.*

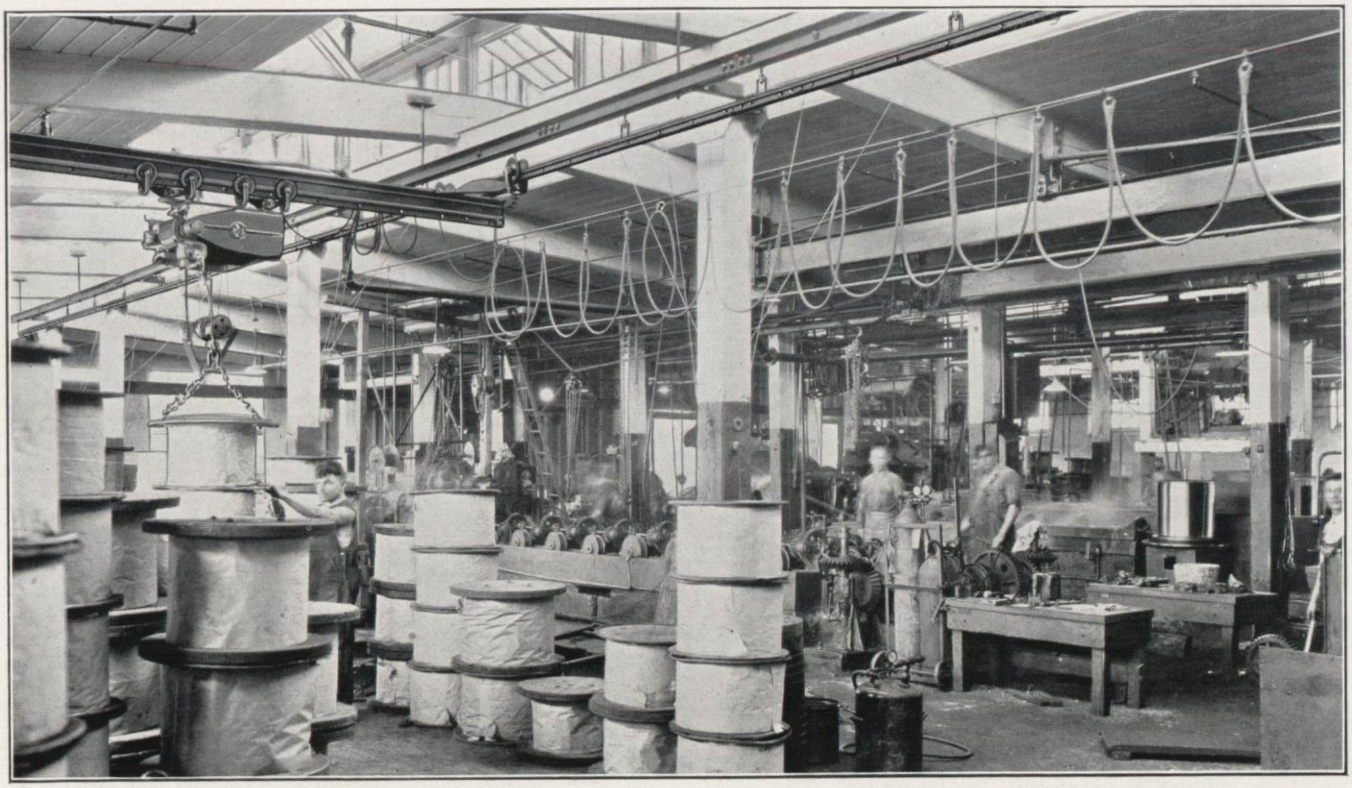


Fig. 94B *Large reels and coils of cable are handled by electric hoist on this MonoRail crane in the plant of the Okonite Company, Passaic, N. J. Hoist is served by looped, flexible cable.*

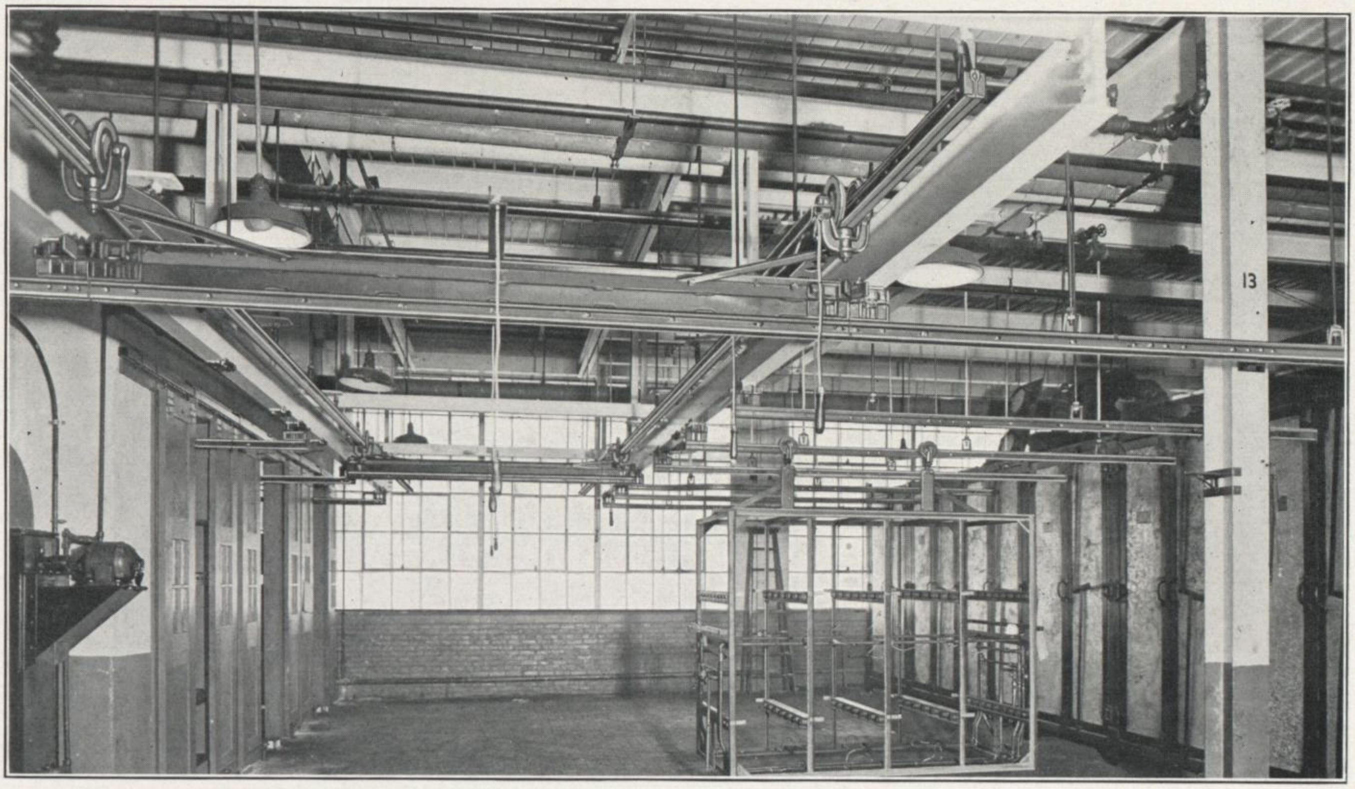


Fig. 95 *MonoRail Cranes in Service of Large Electrical Manufacturer. Note that Cranes Interlock with Connecting Track at Both Ends.*

American MonoRail Cranes

Where an overhead material handling system calls for the services of a mobile lifting and carrying unit over a considerable floor area, or where a number of tracks call for inter-connection or transfer facilities, American MonoRail Cranes furnish an efficient means of accomplishing both purposes.

LIGHTNESS

In designing and building American MonoRail Cranes dead weight has been reduced to the lowest possible point consistent with strength. The purchaser of a MonoRail Crane has the great advantage of less dead weight to move and of maximum live load capacity.

EASE OF HANDLING

MonoRail Cranes are hand propelled and require a minimum of tractive effort to start and move the load. This is due in part to the elimination of weight in the construction and in part to the large diameter crane wheels mounted on precision ball bearings, and the flexibility of the connections in the end trucks, load bars and wheel yokes.

SMOOTH TRAVEL

Crane runways of standard MonoRail, Truss or Girder Rail, with their 18-inch lap splice furnish smooth trackage for crane wheels, without jolt or jar at rail connections to cause vibration in runway, building or load carried.

HEADROOM

The diagrams on following pages show how crane and trucks and crane bridge are carried up close to crane runways, affording maximum headroom.

STRENGTH

Drop forged wheels, high-grade malleable yokes and truck frames, and steel load bars, with a crane bridge of American Girder Rail are assembled into a unit having a wide margin of safety with a stiffness which permits the lifting and carrying of loads on long spans.

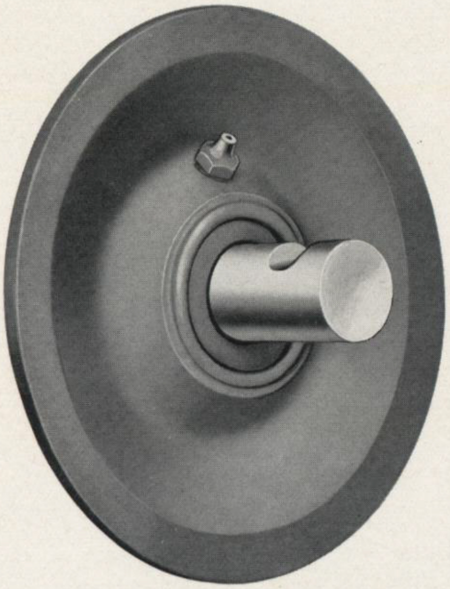
ADAPTABILITY

MonoRail crane may be used as bridge cranes for handling material over a definite area; to serve as transfer cranes between connecting tracks; or to interlock with other cranes operating on parallel runways.

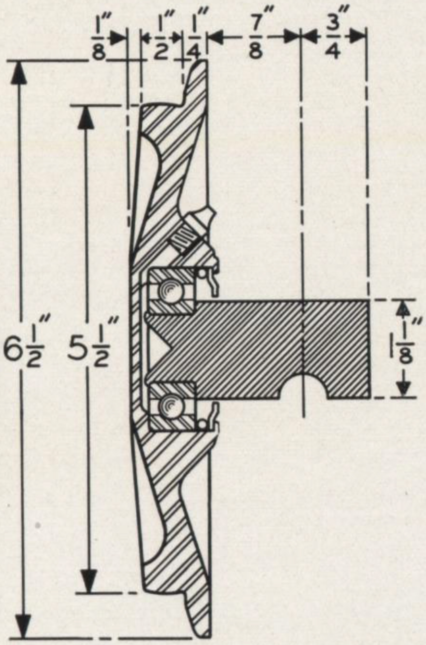
SAFETY

American MonoRail Cranes are protected at all points against the possibility of trolleys leaving open track.

Cranes (Continued)

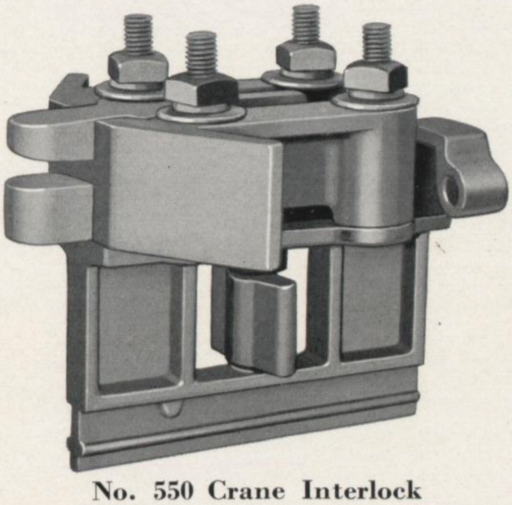


No. 539 Crane Wheel

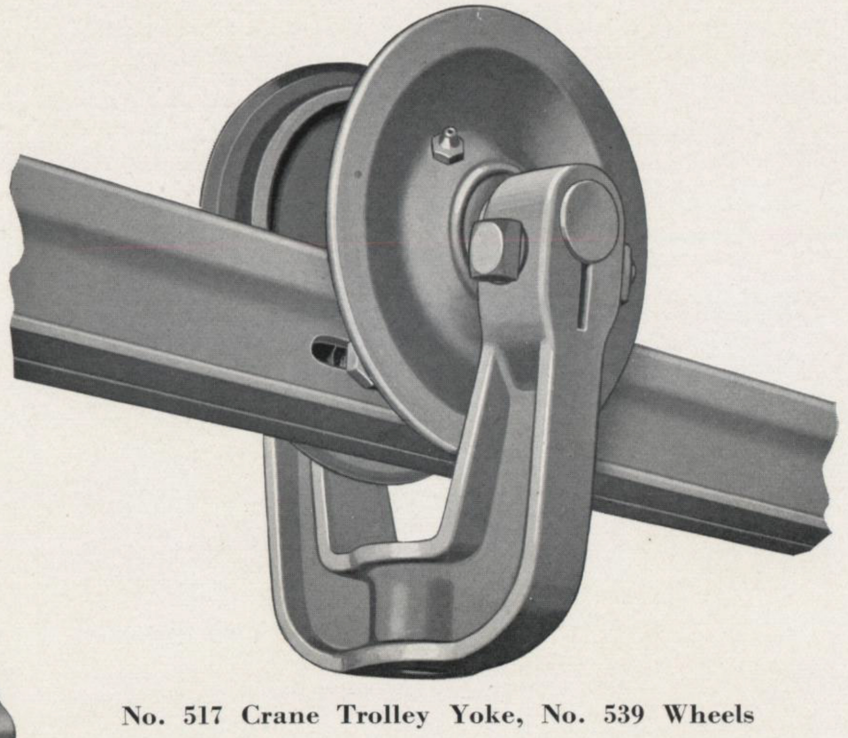


MonoRail Crane Wheels are drop forgings, accurately machined. They are mounted on high duty New Departure precision ball bearings. The wheel forgings are bored and reamed to accurate dimensions and the bearings seated with a light press fit insuring perfect alignment, and the concentricity of bearing with the machined tread of the wheel. Crane wheels are equipped with Zerk-Alemite fitting for pressure lubrication.

The crane interlock assembly, shown below, when mounted on the crane bridge, performs both a latching and a safety function. The upper, or latch bolt, engages a recess in a corresponding position on the connecting track. This latch bolt can be retracted so that crane may pass any number of connecting tracks and then be released to latch into the next. The lower bolt operates the safety stop which permits trolleys to pass only when interlocking is complete, and crane is held in accurate register with connecting track.



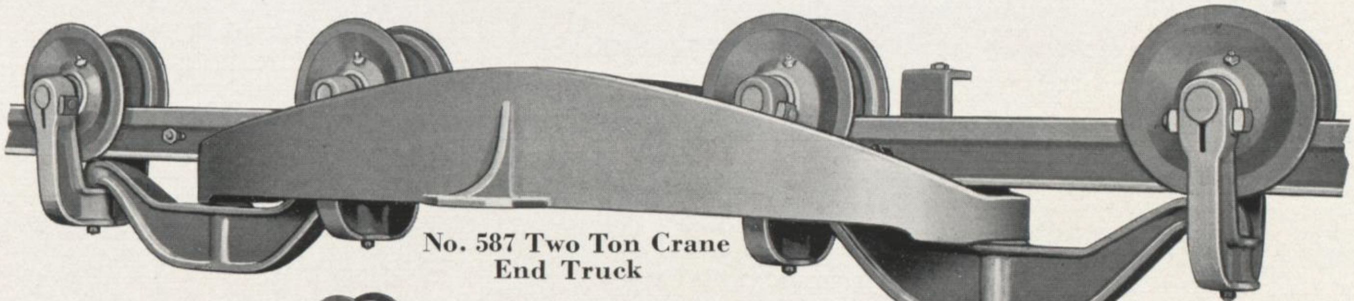
No. 550 Crane Interlock



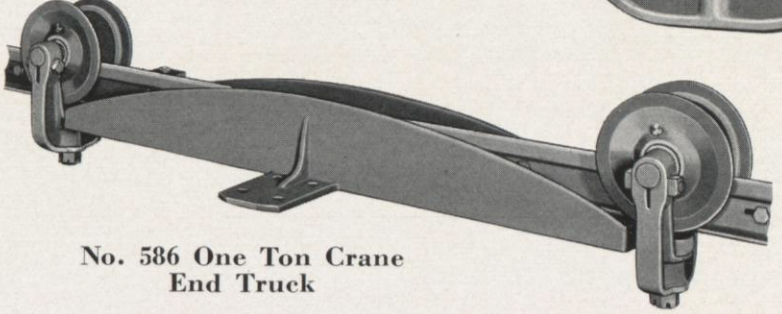
No. 517 Crane Trolley Yoke, No. 539 Wheels

Crane Wheel and Yoke Assembly

The Crane Trolley Yoke is a high-grade malleable casting in which crane wheels, carried on machined steel axles, are accurately mounted. Load-carrying members rest on top of trolley yoke, a noteworthy safety feature in MonoRail crane design. The yoke is a one-piece frame designed for maximum loads.



No. 587 Two Ton Crane End Truck



No. 586 One Ton Crane End Truck

MonoRail Crane End Trucks

MonoRail Cranes are carried on high-grade malleable end truck frames. The illustration above shows the truck frames assembled for attachment to crane bridge. The lower truck frame is No. 540, used on One-Ton MonoRail Cranes. Note that the end of the truck frame is carried on the trolley yoke. In truck frame No. 541 above, it will be noted that the end of the truck frame rests on the cast alloy steel load bar, which in turn is carried on the yoke of the trolley. This is the Two-Ton Crane Truck. This design embodies an ample factor of safety and provides an extremely flexible assembly which adds to the ease of handling all MonoRail Cranes.

In this illustration is shown the assembled One-Ton Crane End Truck on which is mounted crane bridge equipped with interlock . Crane is here shown in position of interlock with connecting track. The latch-bolt holds the crane in accurate register, the safety stop being held in position to permit trolleys to pass.

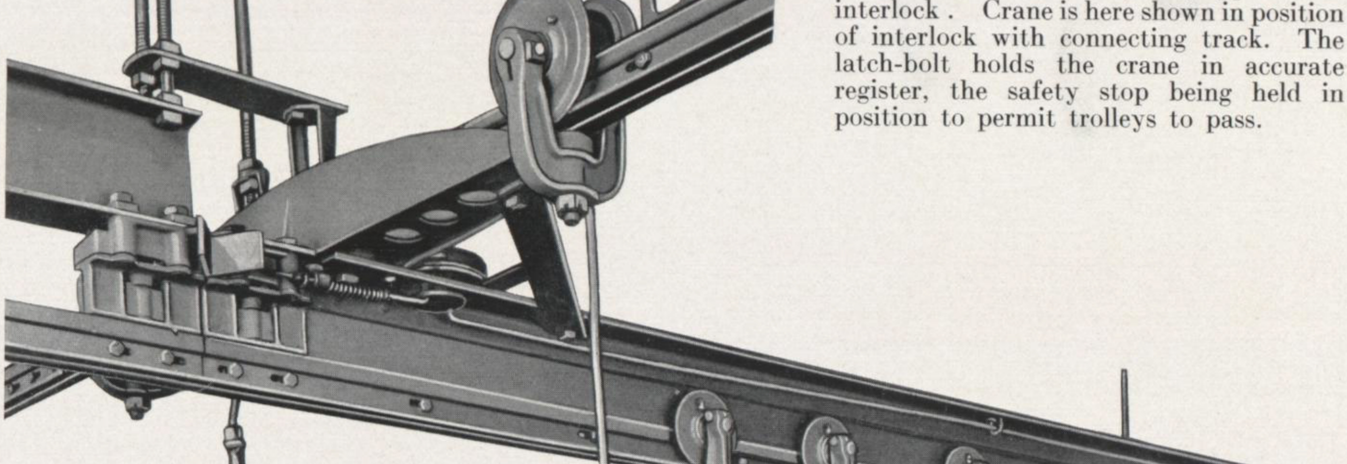
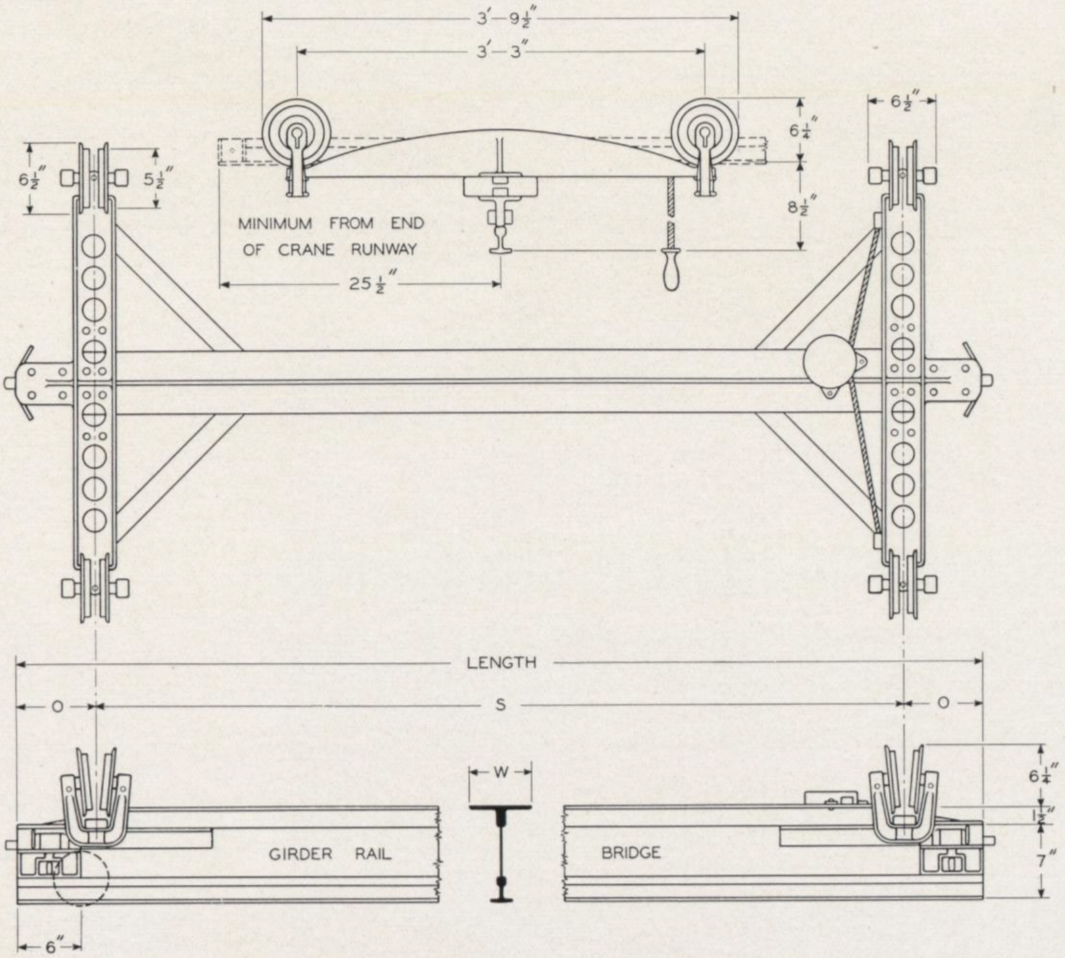


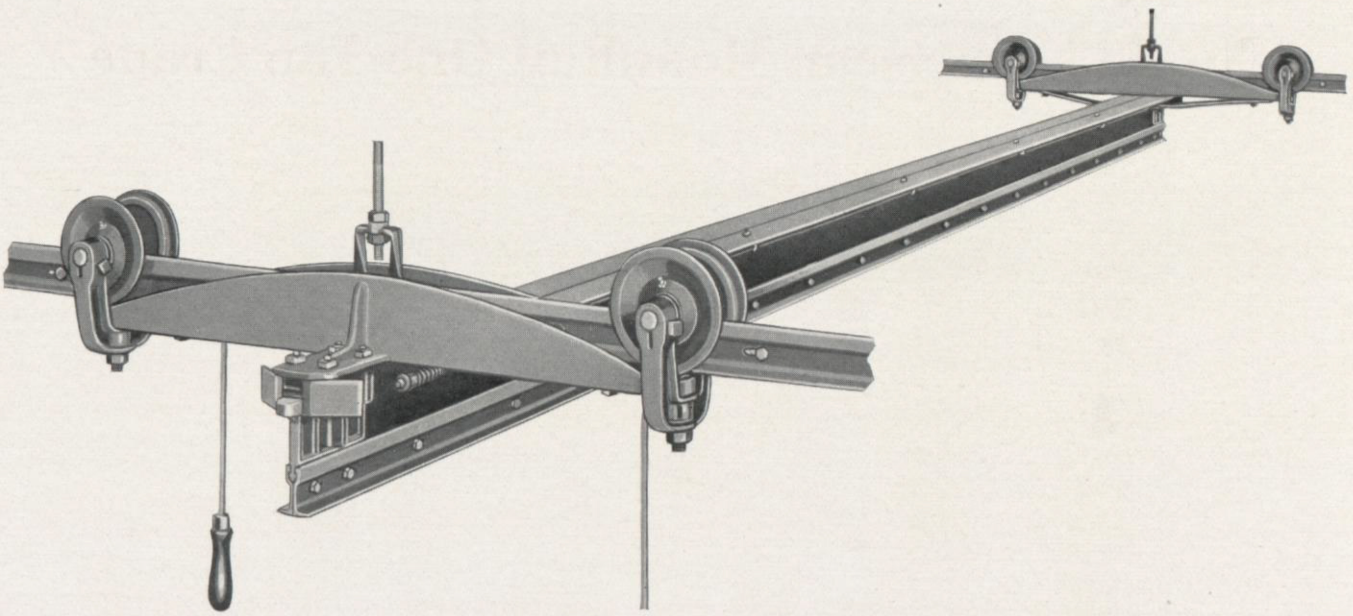
Fig. 97

No. 543 American MonoRail One-Ton Crane



DIMENSIONS			NO. E-542 NON-INTERLOCKING		NO. 543 INTERLOCKING	
Length	Depth Bridge	Maximum Overhang	Weight	Estimated Shipping Weight	Weight	Estimated Shipping Weight
10′	7″	12″	315	365	342	422
12′	7″	14″	349	389	360	440
14′	7″	16″	377	417	391	471
16′	7″	18″	411	451	422	502
18′	9″	21″	480	520	452	532
20′	9″	24″	515	555	545	625
22′	9″	27″	540	590	580	660
24′	11″	30″	661	701	706	786
26′	11″	34″	703	743	748	828
28′	11″	38″	744	784	789	869
30′	11″	42″	786	826	831	911
THREE TRUCK CRANES						
32′	7″	48″	746	805	775	835
34′	7″	48″	779	839	808	868
35′	7″	48″	812	872	841	901
38′	7″	48″	845	905	874	934
40′	7″	48″	878	938	907	967
42′	9″	48″	1063	1123	1146	1205
44′	9″	48″	1098	1158	1181	1241
46′	9″	48″	1133	1193	1216	1276
48′	9″	43″	1168	1228	1251	1311
50′	9″	43″	1203	1263	1286	1346

Crane Capacity is for total load including Trolley and Hoist equipment. *See page 172 for details of clearance and interlocks.*
Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 542 One-Ton Crane—Non Interlocking

No. 543 One-Ton Crane—Interlocking

Specifications

Crane Bridge: American Girder Rail.

Crane End Trucks: High-grade Malleable Castings.

Wheels: Steel Forgings. Tread Diameter 5-½″.

Wheel Yokes: High-grade Malleable Castings.

Bearings: High duty New Departure precision ball.

Crane Runway: Standard MonoRail, Truss or Girder Rail.

Lubrication: Crane Wheels equipped for Zerk-Alemite.

Interlock: May be equipped to interlock with connecting track or other cranes.

Finish: Green Enamel.

Dimensions: See table and sketch on opposite page.

Dimensions given are for estimating purposes only. Certified prints should be secured for working drawings.

Those material handling situations which call for the installation of a crane, in which the load lifting demands do not exceed 2000 pounds, will be efficiently and amply served by this MonoRail one-ton crane.

There is a minimum of dead load to be moved in American MonoRail handling equipment, and the one-ton crane has been designed to give the user a maximum of net live load capacity. This is an important basis for judging crane performance.

The one-ton crane is easily started and moved under load, a great saving in man-power where cranes are used continuously. The large diameter wheels mounted on New Departure precision ball bearings, and the lightness of the crane contribute to this ease of propelment.

The MonoRail one-ton crane may be furnished non-interlocking or with interlocking device to register with connecting tracks or other cranes.

All MonoRail Cranes are equipped with automatic safety stops protecting all open rail ends. Trolleys cannot leave tracks on cranes or connecting MonoRail.

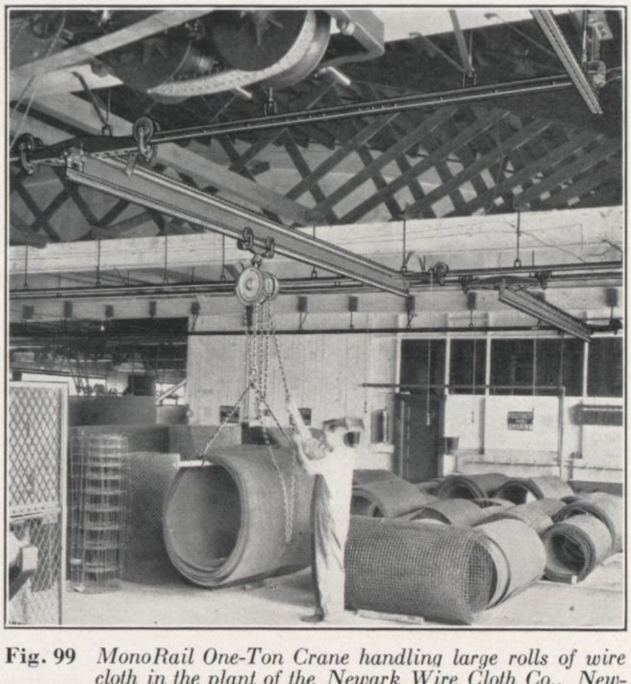
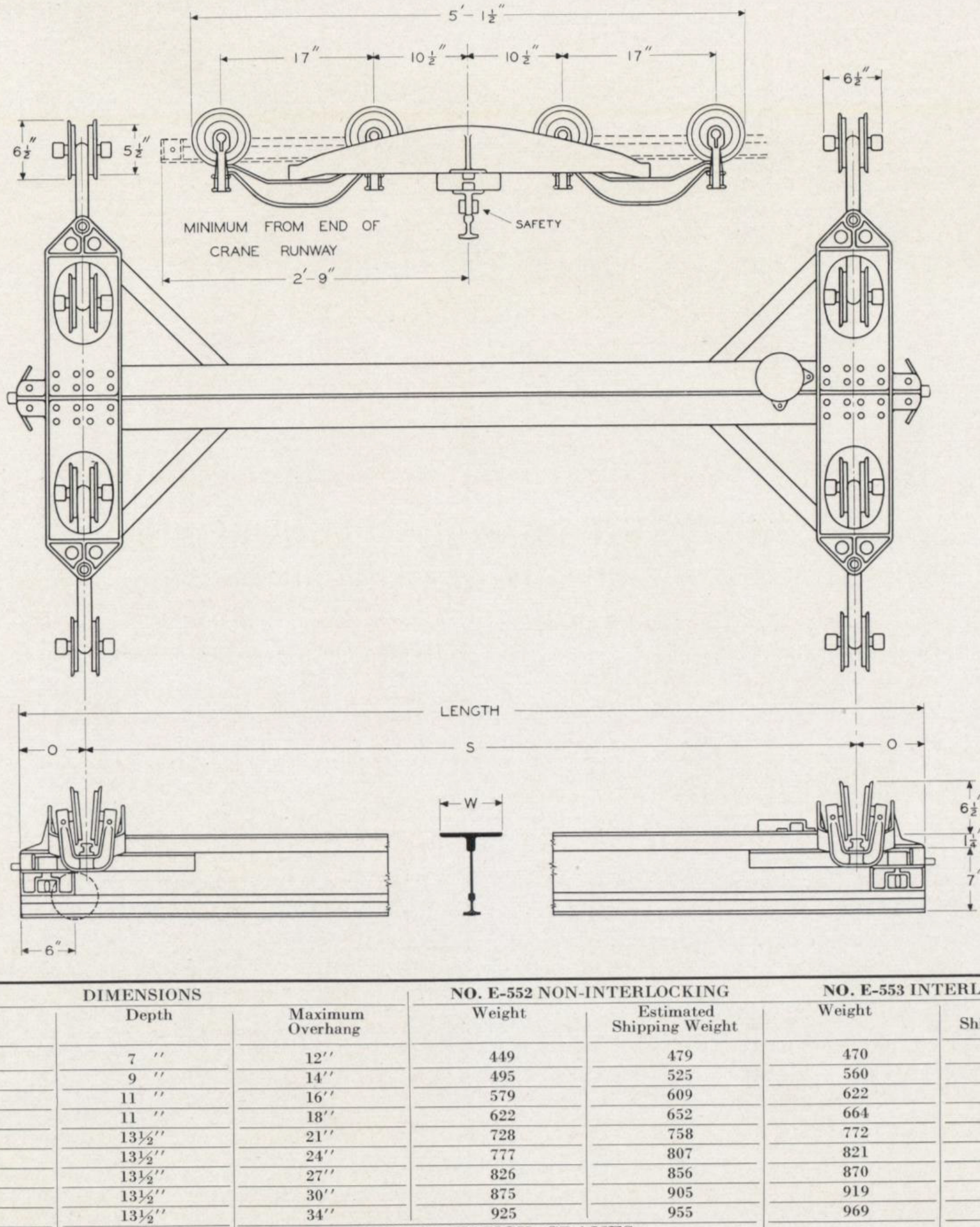


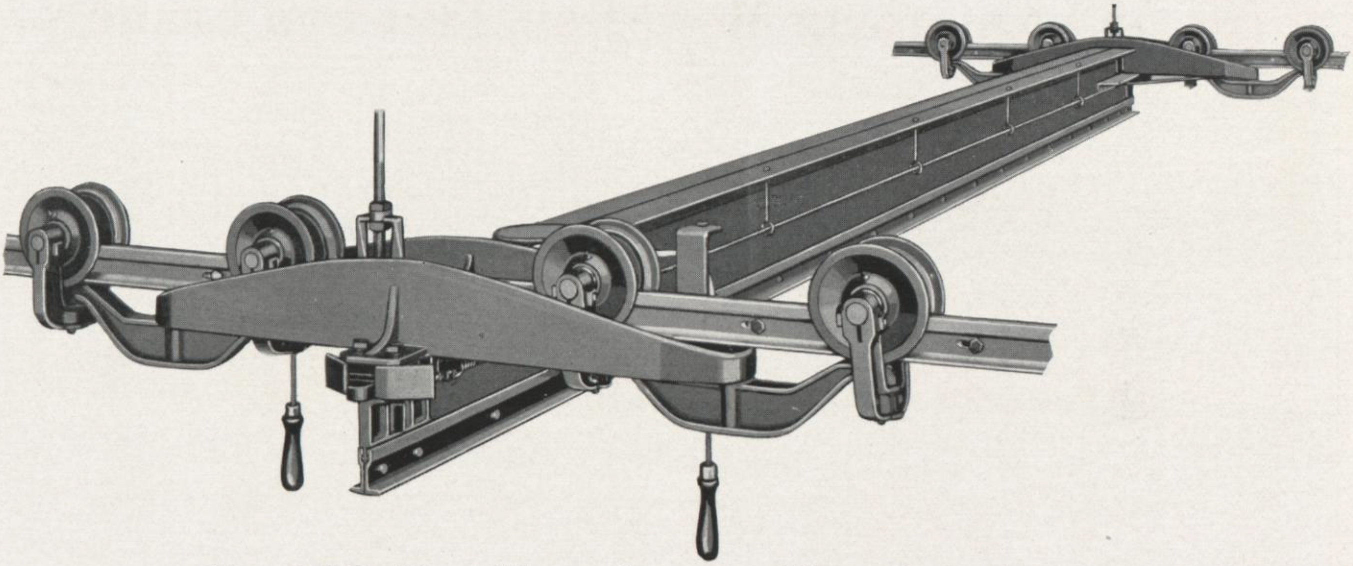
Fig. 99 *MonoRail One-Ton Crane handling large rolls of wire cloth in the plant of the Newark Wire Cloth Co., Newark, N. J.*

No. 553 American MonoRail Two-Ton Crane



DIMENSIONS			NO. E-552 NON-INTERLOCKING		NO. E-553 INTERLOCKING	
Length	Depth	Maximum Overhang	Weight	Estimated Shipping Weight	Weight	Estimated Shipping Weight
10′	7 ″	12″	449	479	470	550
12′	9 ″	14″	495	525	560	640
14′	11 ″	16″	579	609	622	702
16′	11 ″	18″	622	652	664	744
18′	13½″	21″	728	758	772	852
20′	13½″	24″	777	807	821	901
22′	13½″	27″	826	856	870	950
24′	13½″	30″	875	905	919	999
26′	13½″	34″	925	955	969	1049
THREE TRUCK CRANES						
28′	11 ″	38″	1003	1033	1025	1105
30′	11 ″	42″	1043	1073	1067	1147
32′	11 ″	48″	1084	1114	1108	1188
34′	11 ″	48″	1125	1155	1150	1230
36′	11 ″	48″	1167	1197	1191	1271
38′	13½″	48″	1350	1380	1405	1485
40′	13½″	48″	1399	1429	1481	1561
42′	13½″	48″	1448	1478	1504	1584
44′	13½″	48″	1497	1527	1555	1635
46′	13½″	48″	1546	1576	1603	1683
48′	13½″	48″	1595	1625	1653	1733
50′	13½″	48″	1654	1684	1702	1782

Crane Capacity is for total load including Trolleys and Hoist Equipment. *See page 172 for details of clearance and interlocks.*
Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 552 Two-Ton Crane—Non Interlocking

No. 553 Two-Ton Crane—Interlocking

Specifications

Crane Bridge: American Girder Rail.

Crane End Trucks: High-grade Malleable Castings.

Trolley Load Bars: Drop Forgings.

Wheels: Drop Forgings. Diameter 5½″.

Wheel Yokes: High-grade Malleable Castings.

Bearings: High Duty New Departure Precision Ball.

Crane Runway: Standard MonoRail or American Girder Rail.

Lubrication: Crane wheels equipped for Zerk-Alemite.

Interlock: May be equipped with interlocking device.

Finish: Green Enamel.

Dimensions: See table and sketch on opposite page.

Dimensions given are for estimating purposes only. Certified prints should be secured for working drawings.

American MonoRail Two-Ton Cranes have been designed to supply a unit which covers the requirements between the capacity of the one-ton crane and a limit of 4000 pounds.

The Two-Ton Crane embodies all the advantages of lightness, ease of propelment, strength, live load capacity, interlocking, and safety features built into the One-Ton Crane.

Added carrying capacity is secured in the two-ton crane by the use of eight wheels on each end truck. These wheels are mounted on New Departure precision ball bearings. The crane end trucks are mounted on cast alloy steel load bars which in turn are carried on the trolley yokes, an assembly which assures the utmost in safety, provides greatest flexibility in movement, and contributes largely to the ease of propelment of cranes under load. When maximum loads are carried on the end of MonoRail cranes, it will not cause the other end of the crane to drag or bind.

The American Girder Rail used as the bridge member provides a wide margin of lateral strength with a stiffness which permits the lifting and carrying of loads on long spans.

For heavy foundry service or the handling of lighter material MonoRail Cranes operate easily and smoothly over standard MonoRail, Truss or Girder Rail with their 18-inch lap splice at joints.

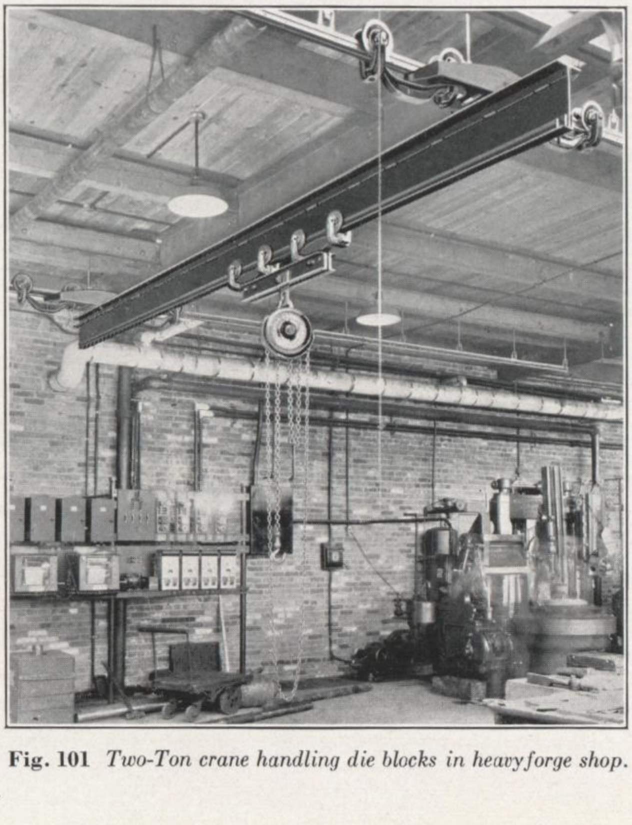


Fig. 101 *Two-Ton crane handling die blocks in heavyforge shop.*

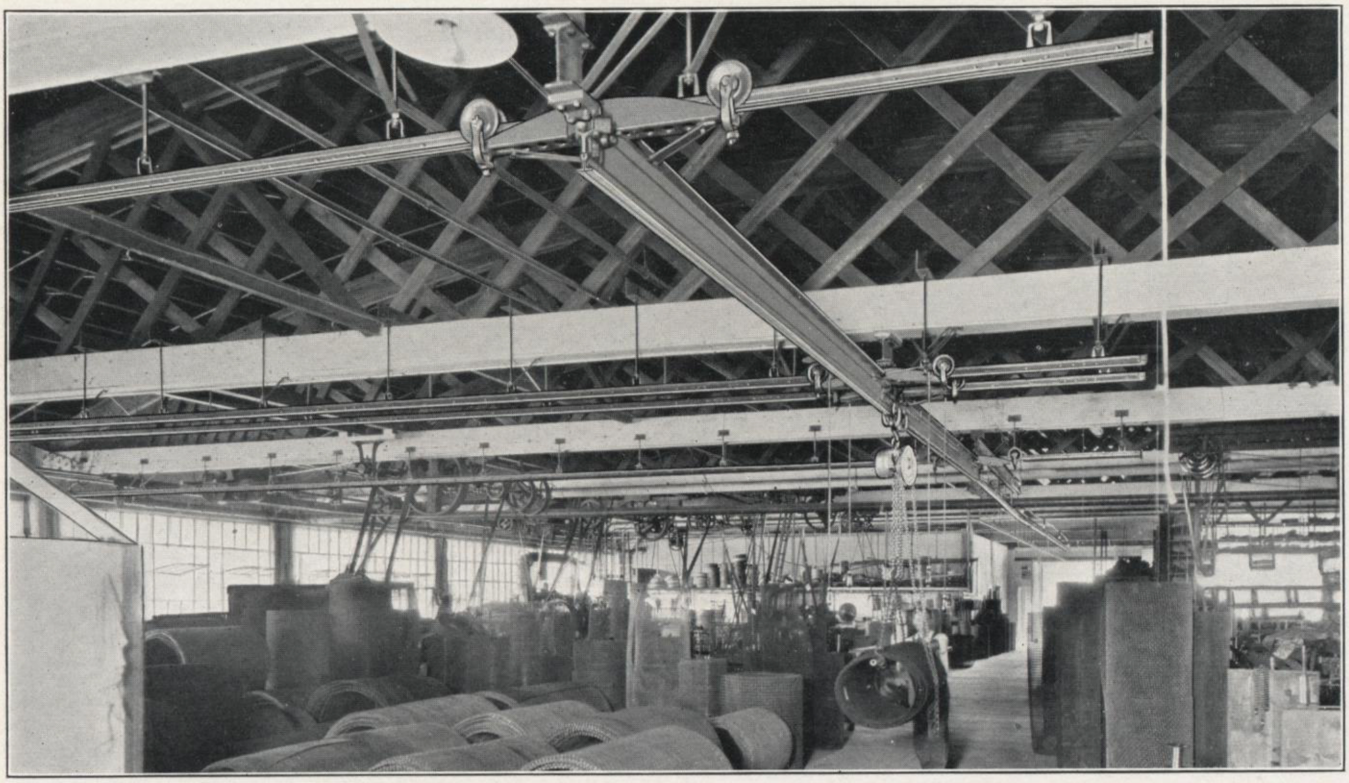


Fig. 102A *Interlocking MonoRail cranes in the plant of the Newark Wire Cloth Co., Newark, New Jersey. Cranes are used to handle large rolls of wire cloth which would be very difficult to handle by any other means.*

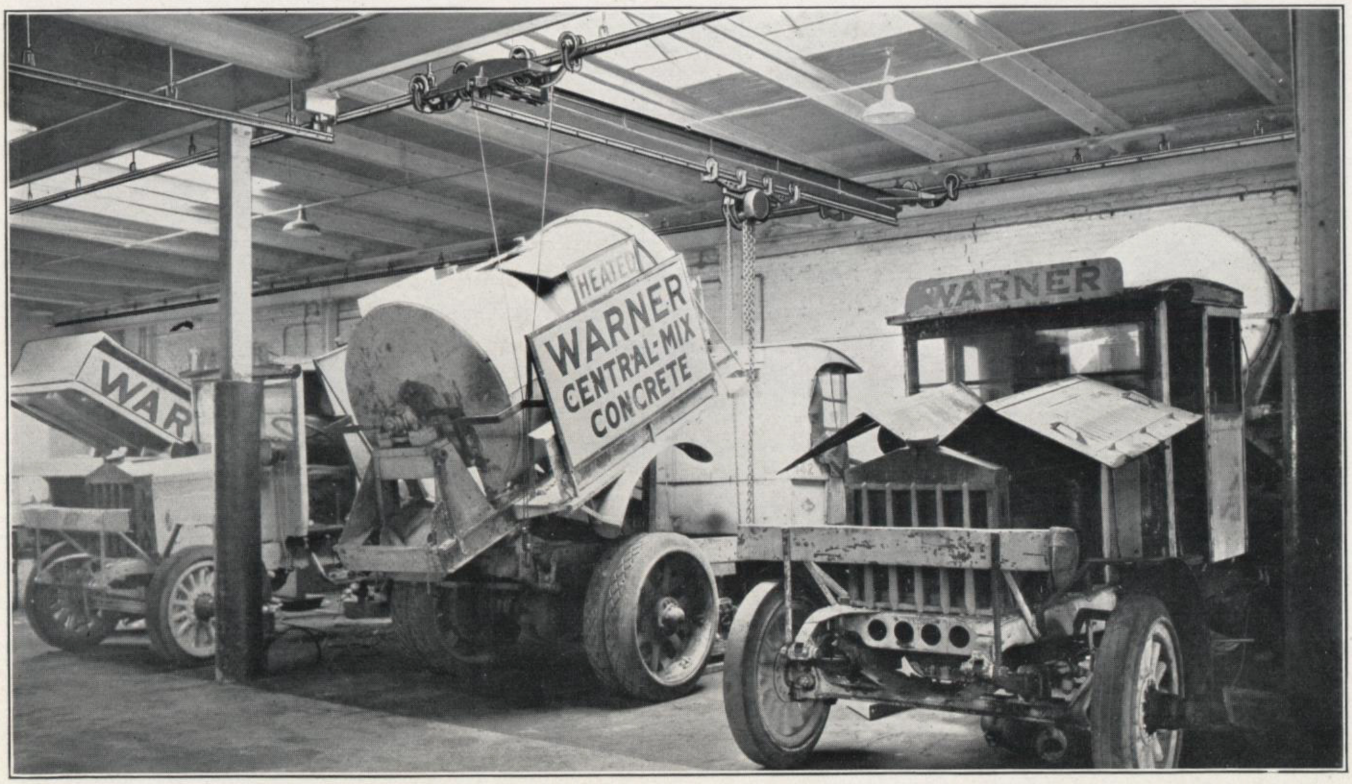


Fig. 102B *Two-Ton MonoRail crane installed for heavy repair service in motor truck garage. Crane is equipped with interlock to connect with MonoRail track for handling motors to and from machine shop.*

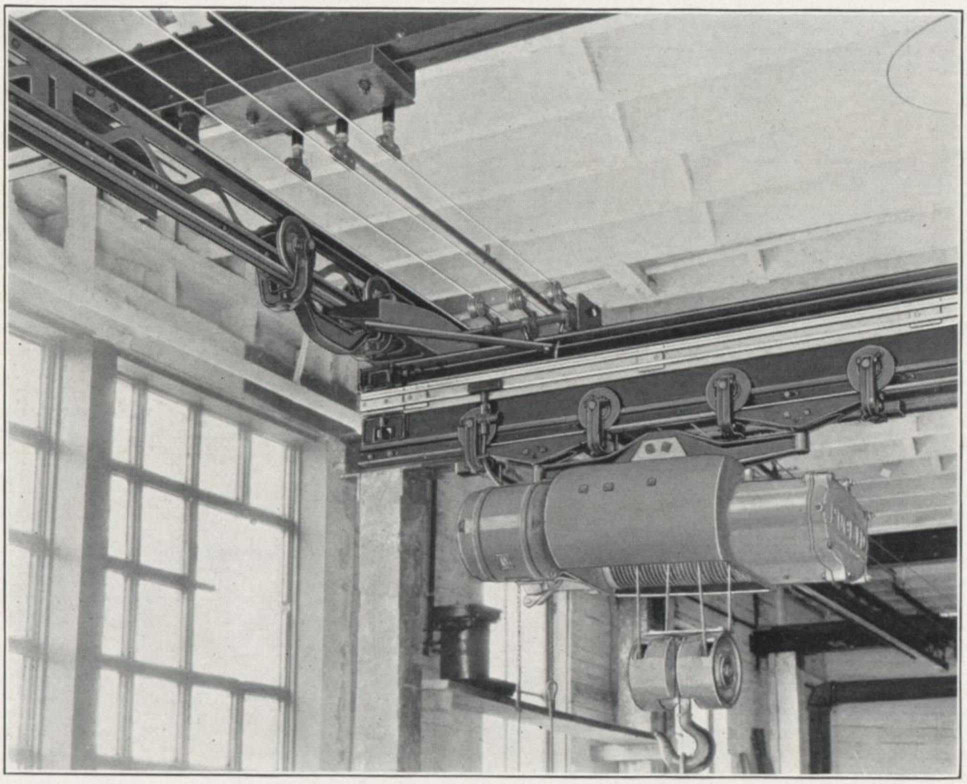


Fig. 103A *Electrified Two-Ton MonoRail Crane, part of installation in warehouse of Super Steels, Inc., Cleveland, Ohio. Runway electrified as described below. Note use of Truss Rail for crane runway.*

Electrified MonoRail Cranes

Electrified MonoRail Cranes, in detail of mechanical construction and operation, are identical in most respects with those of non-electrified type.

Conductor bars for the electrification of the crane bridge are carried by ebonite blocks in which they are firmly clamped as in the case of the track electrification. Ample clearance between conductor bars and crane web is provided by this mounting.

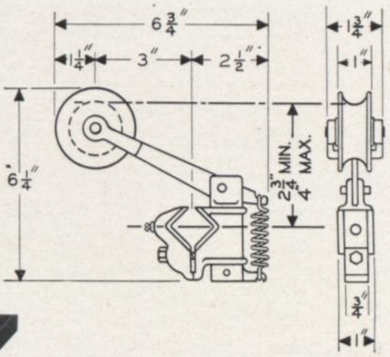


Fig. 103B

Interlocking members on electrified cranes are identical in operation with those used in non-electrified units. The safety feature operates with the same efficiency, the increased depth of the crane bridge being provided for with no essential change in design.

MonoRail Electrified Cranes are assembled from the standard units used in non-electrified equipment of this type—crane end trucks, wheels, load bars being the same throughout. The only variation is in the crane bridge in which a minimum depth of eleven inches is required.

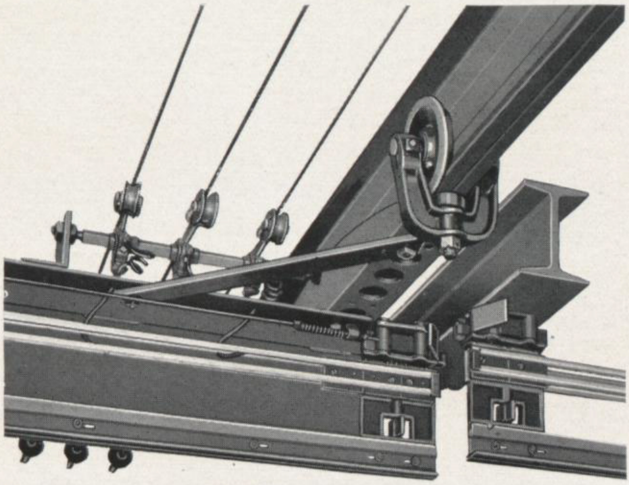
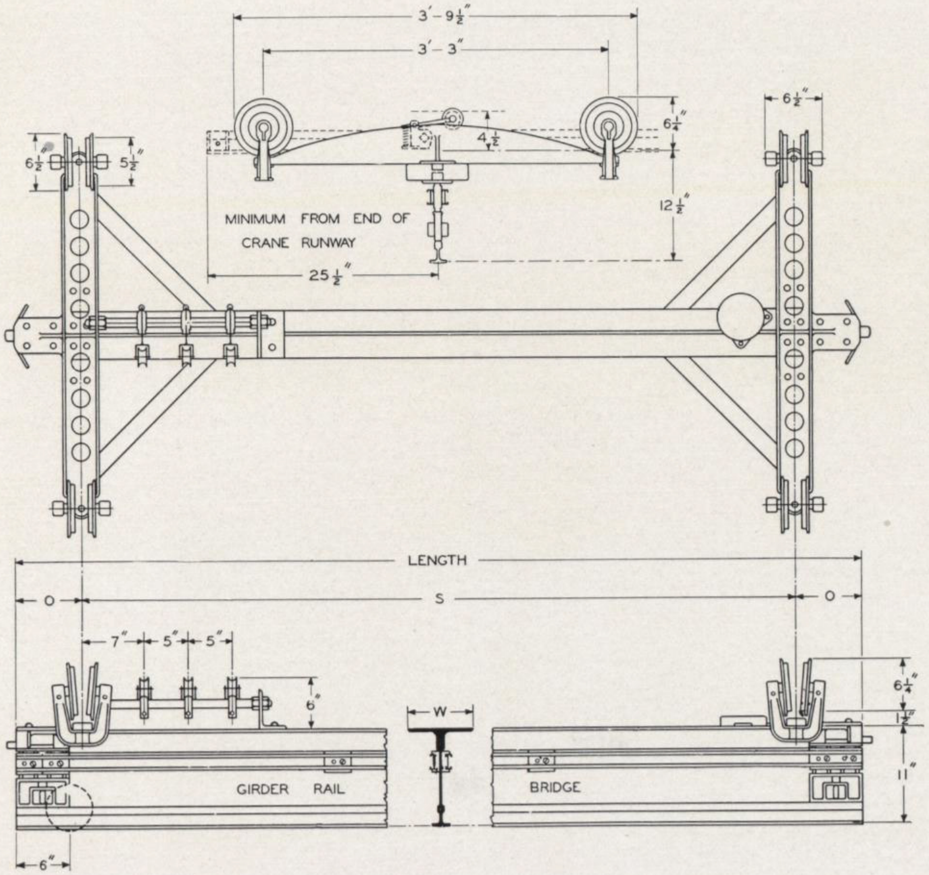


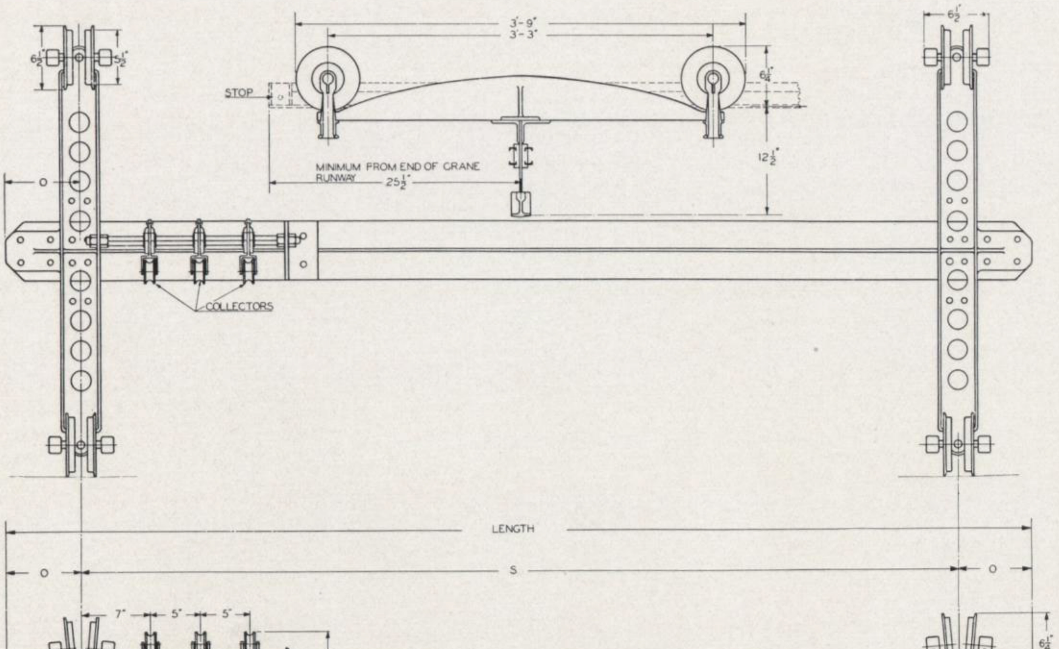
Fig. 103C

Crane runways are electrified by the use of hard drawn copper wire conductors from which current is carried to the crane bridge conductor bars by groove type collectors mounted above the crane bridge as shown below. This method of electrification is one in common use. Other types of electrification are shown on page 171.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

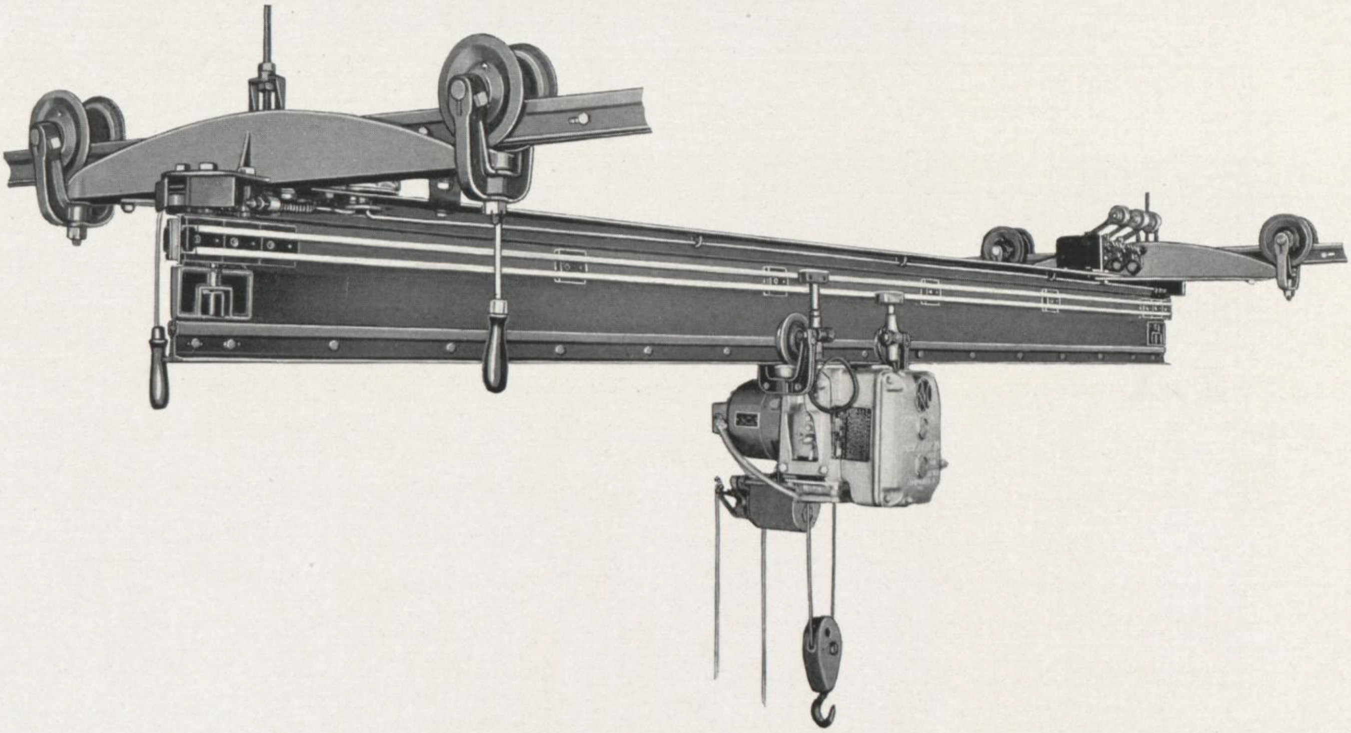


No. 545 One-Ton Electrified Crane equipped to interlock with connecting track or other cranes.



No. 544 One-Ton Electrified Crane. Non-Interlocking.

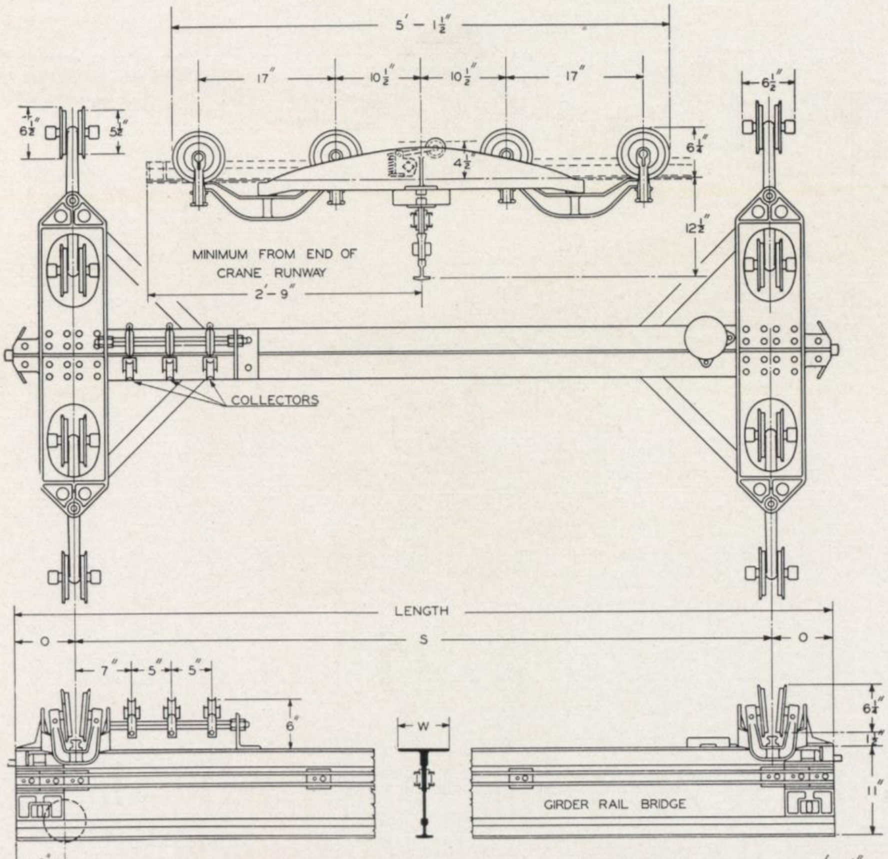
Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



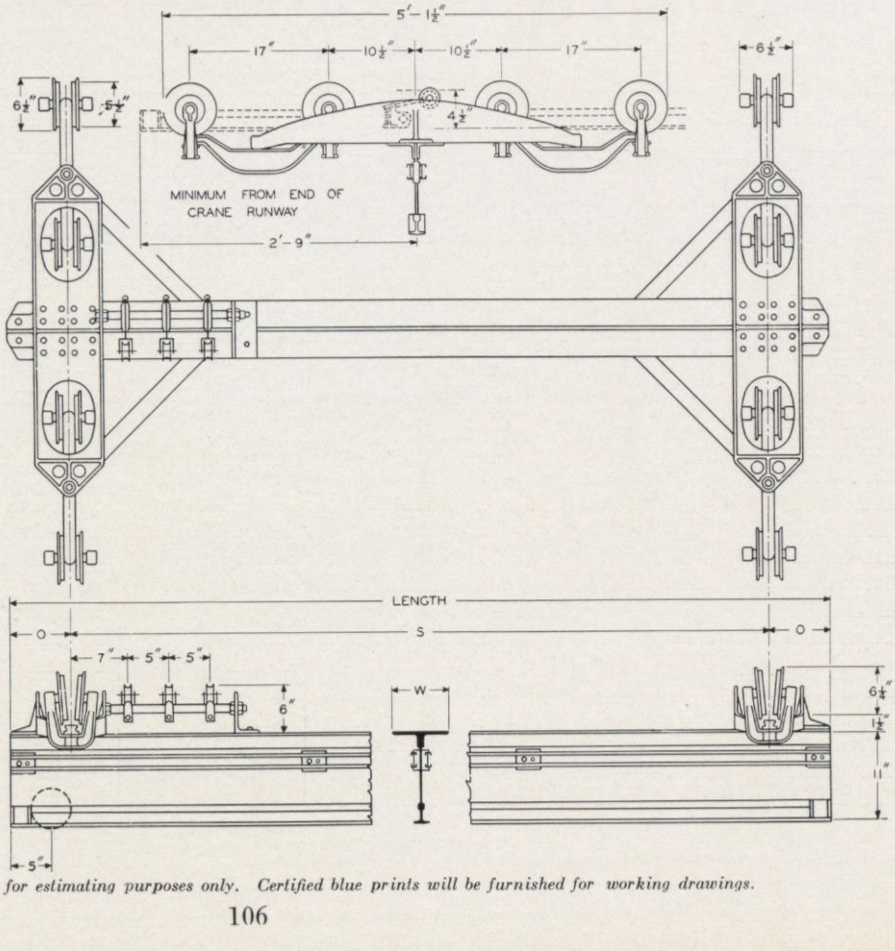
No. 544 Electrified One-Ton Crane—Non Interlocking
No. 545 Electrified One-Ton Crane—Interlocking

ELECTRIFIED ONE TON CRANE DIMENSIONS AND CAPACITIES						
Dimensions			**No. E-544** Non-Interlocking		**No. E-545** Interlocking	
Length	Depth	Maximum Overhang	Weight	Estimated Shipping Weight	Weight	Estimated Shipping Weight
10′	11″	12″	400	500	414	514
12′	11″	14″	448	548	462	562
14′	11″	16″	495	595	509	609
16′	11″	18″	541	641	557	657
18′	11″	21″	588	688	604	704
20′	11″	24″	635	735	651	751
22′	11″	27″	683	783	699	799
24′	11″	30″	732	832	742	842
26′	11″	34″	774	874	794	894
28′	11″	38″	825	925	841	941
30′	11″	42″	873	973	889	989
		THREE TRUCK CRANE				
32′	11″	48″	993	1101	1022	1170
34′	11″	48″	1035	1146	1151	1302
36′	11″	48″	1077	1191	1180	1333
38′	11″	48″	1119	1236	1209	1365
40′	11″	48″	1161	1281	1238	1397
42′	11″	48″	1203	1326	1267	1429
44′	11″	48″	1245	1371	1296	1461
46′	11″	48″	1287	1416	1325	1493
48′	11″	48″	1329	1461	1354	1525
50′	11″	48″	1371	1506	1383	1557

Crane Capacity is for total load including Trolley and Hoist equipment.

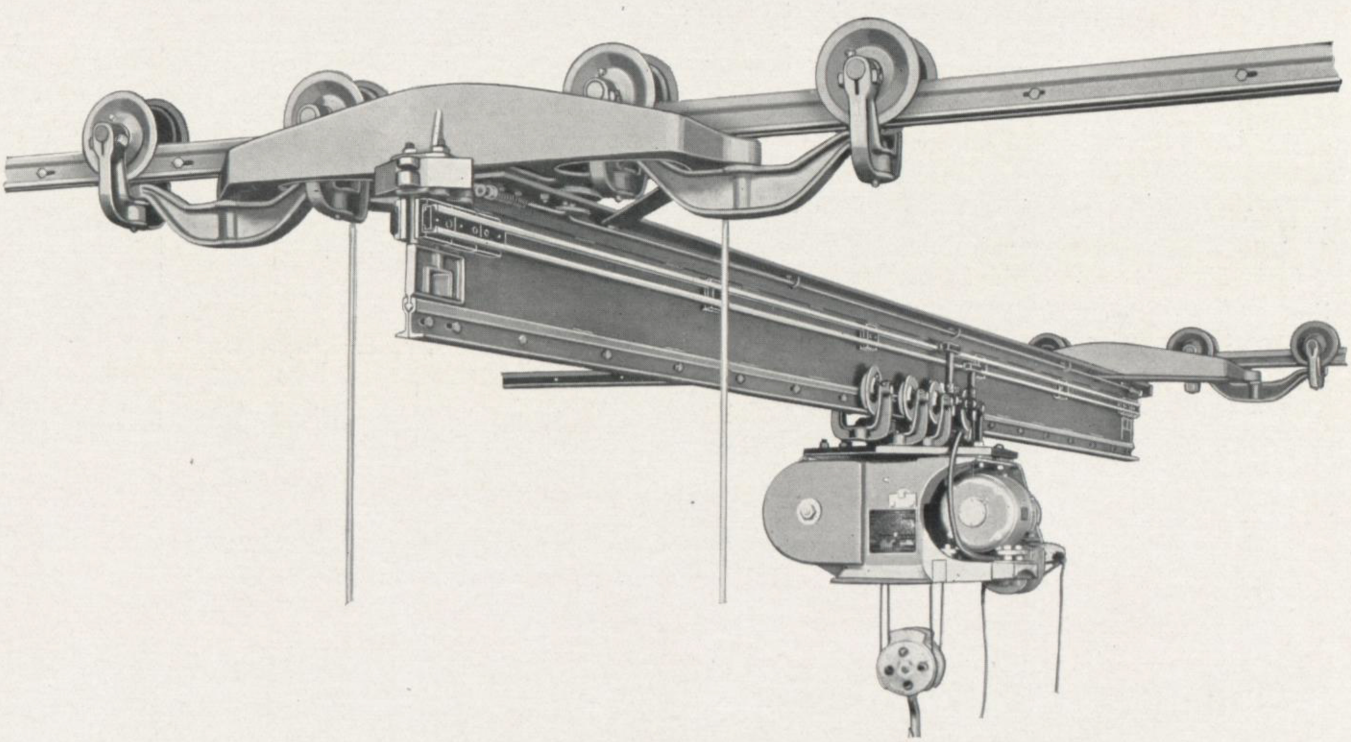


No. 555 Two-ton electrified Mono-Rail Crane equipped to interlock with connecting track or other cranes.



No. 554 Two-ton electrified Crane, Non-Interlocking.

Dimensions given on this page are for estimating purposes only. Certified blue prints will be furnished for working drawings.



No. 544 Electrified Two-Ton Crane—Non Interlocking
No. 555 Electrified Two-Ton Crane—Interlocking

ELECTRIFIED TWO-TON CRANE DIMENSIONS AND WEIGHTS.

Dimensions			No. E-554 Non-Interlocking		No. E-555 Interlocking	
Length	Depth	Maximum Overhang	Weight	Estimated Shipping Weight	Weight	Estimated Shipping Weight
10′	11″	12″	535	555	557	677
12′	11″	14″	583	607	605	729
14′	11″	16″	630	658	652	780
16′	11″	18″	678	710	700	832
18′	13½″	21″	790	826	836	972
20′	13½″	24″	839	879	885	1025
22′	13½″	27″	888	928	934	1074
24′	13½″	30″	937	981	983	1127
26′	13½″	34″	987	1035	1039	1187
			THREE TRUCK CRANES			
28′	11″	38″	1095	1145	1117	1247
30′	11″	42″	1141	1195	1165	1299
32′	11″	48″	1188	1246	1212	1350
34′	11″	48″	1236	1294	1265	1407
36′	13½″	48″	1270	1334	1307	1453
38′	13½″	48″	1478	1546	1521	1671
40′	13½″	48″	1522	1594	1576	1730
42′	13½″	48″	1577	1670	1631	1789
44′	13½″	48″	1632	1712	1686	1848
46′	13½″	48″	1687	1771	1741	1907
48′	13½″	48″	1742	1830	1796	1966
50′	13½″	48″	1797	1890	1851	2025

Crane Capacity is for total load including Trolley and Hoist equipment.

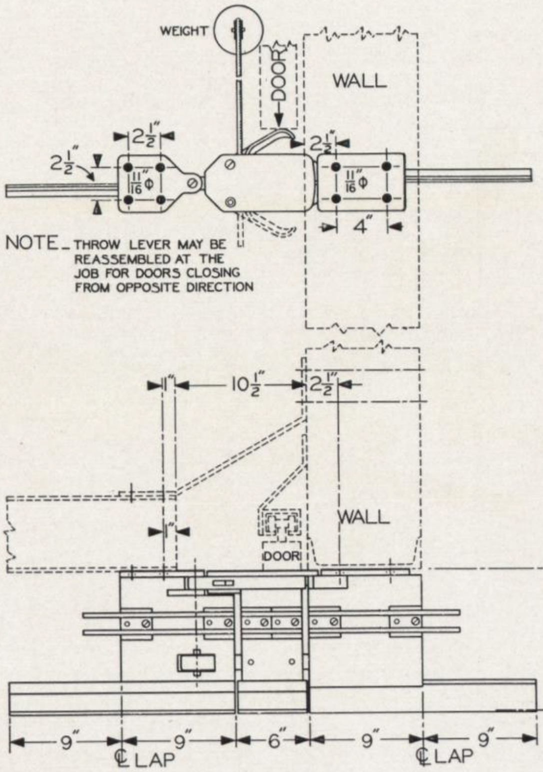
Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Other Electrified MonoRail Equipment

MonoRail Electrification may be applied to equipment other than that illustrated on the preceding pages, for example, the Track Opener for Fire Doors and the Swinging Jib shown on this page, as well as the Lift, shown on pages 120 to 122, and the Swinging Crane, pages 109 and 110.

On equipment such as the Cross Track Switch and the Standard and Giant Turntables, installed as a part of electrified systems, conductor bars are supplied to furnish support for collector shoes as trolleys pass through them.

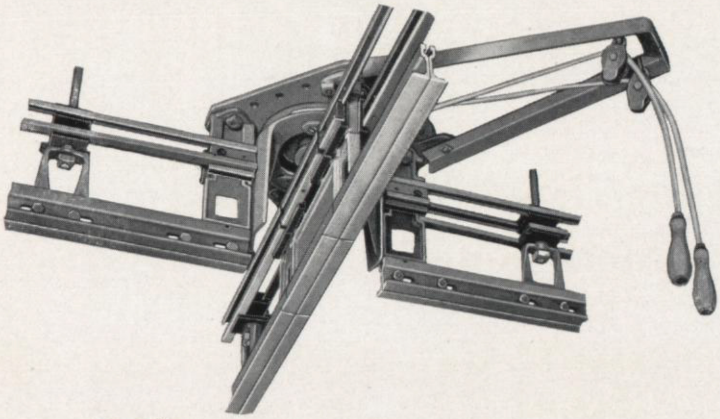
For additional information see pages 171 and 172.



NOTE – THROW LEVER MAY BE REASSEMBLED AT THE JOB FOR DOORS CLOSING FROM OPPOSITE DIRECTION

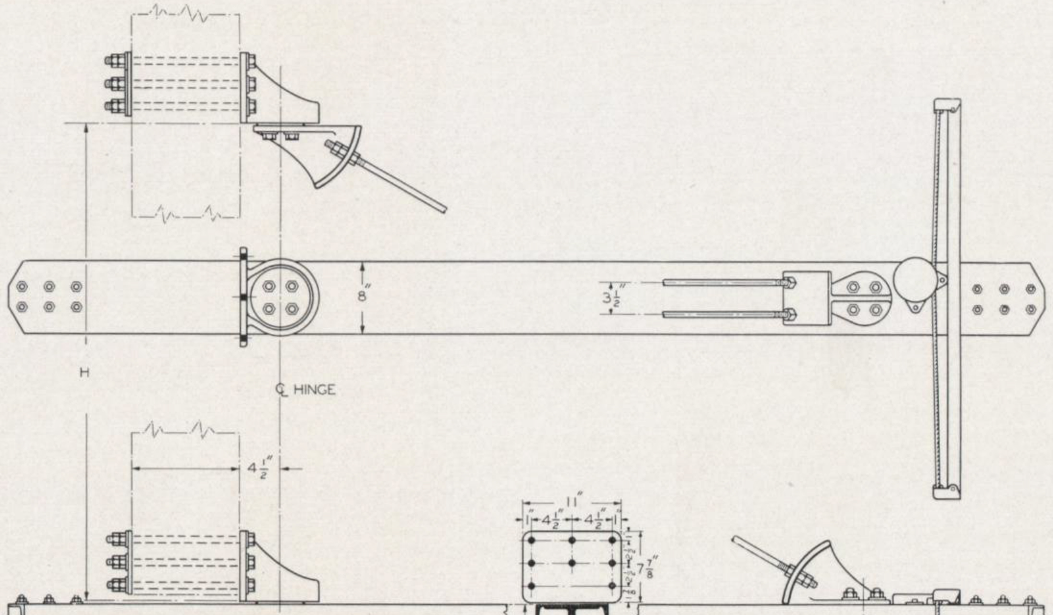
No. 1095

Drawing of electrified MonoRail track opener for fire doors.



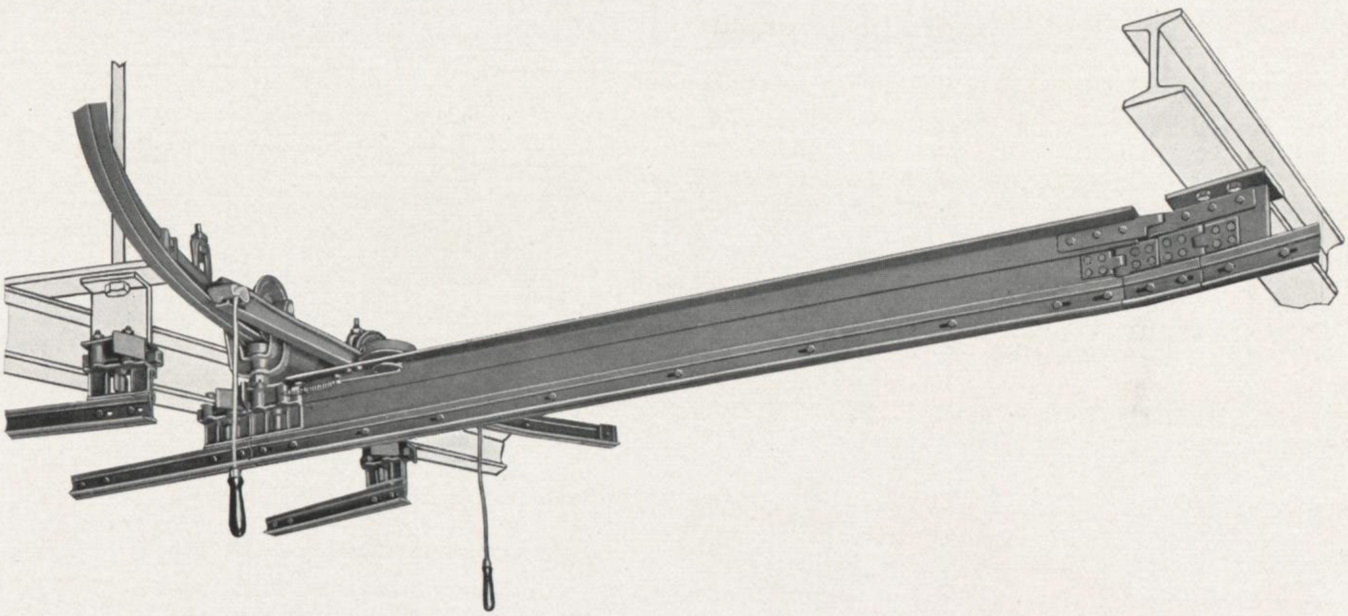
No. 320

Above— *MonoRail cross track switch, equipped with conductor bars.*



No. 1815
Electrified MonoRail swinging jib.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 582 Swinging Crane—Non Interlocking
No. 583 Swinging Crane—Interlocking

Specifications

Crane Bridge: Girder Rail.
Crane Truck: Malleable Castings.
Wheels: Drop Forgings with New Departure, High Duty Precision Ball Bearings.
Yokes: Malleable Castings.
Crane Runway: Standard MonoRail Track.
Interlock: May be furnished interlocking with radiating tracks.
Finish: Green Enamel.
Dimensions: See opposite page.

The MonoRail swinging crane has been designed to connect MonoRail runway with a number of radiating tracks, operating as a multiple switch.

The number of permitted connecting tracks is limited first by the swing of the crane with a 30 degree maximum on either side of the center line of the supporting hinge, also by the minimum space of seven inches allowed between radiating tracks. Where greater than 60° swing is desired, special fittings are necessary and can be furnished.

Smooth travel of trolleys over the stationary end of this crane is provided by the specially designed flexible hinge.

Standard MonoRail design and construction insures an ample factor of safety in the operation of this swinging crane.

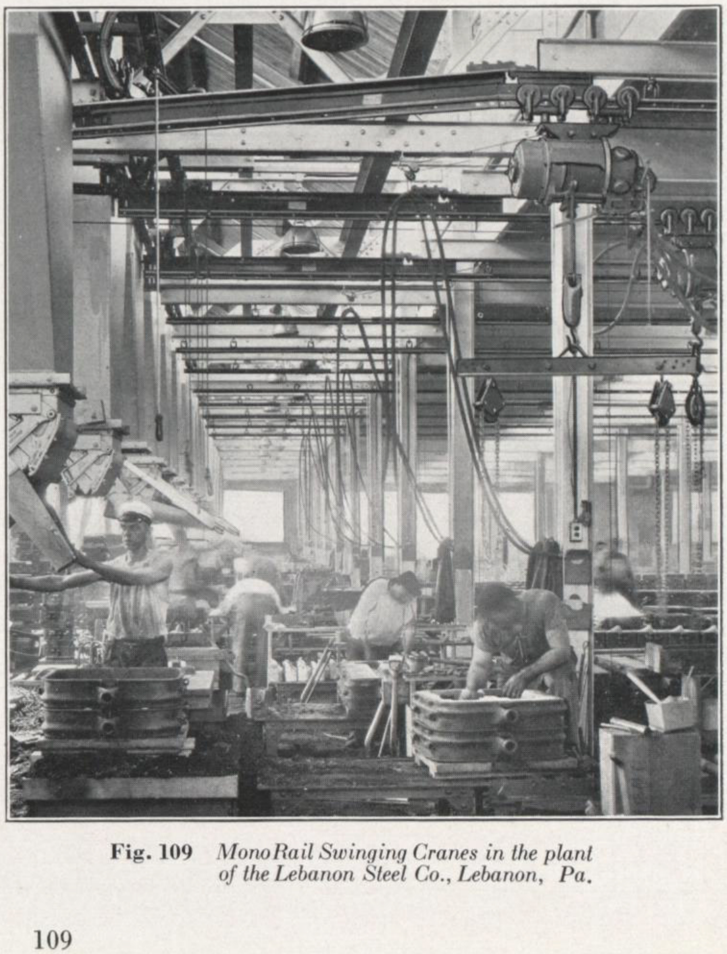
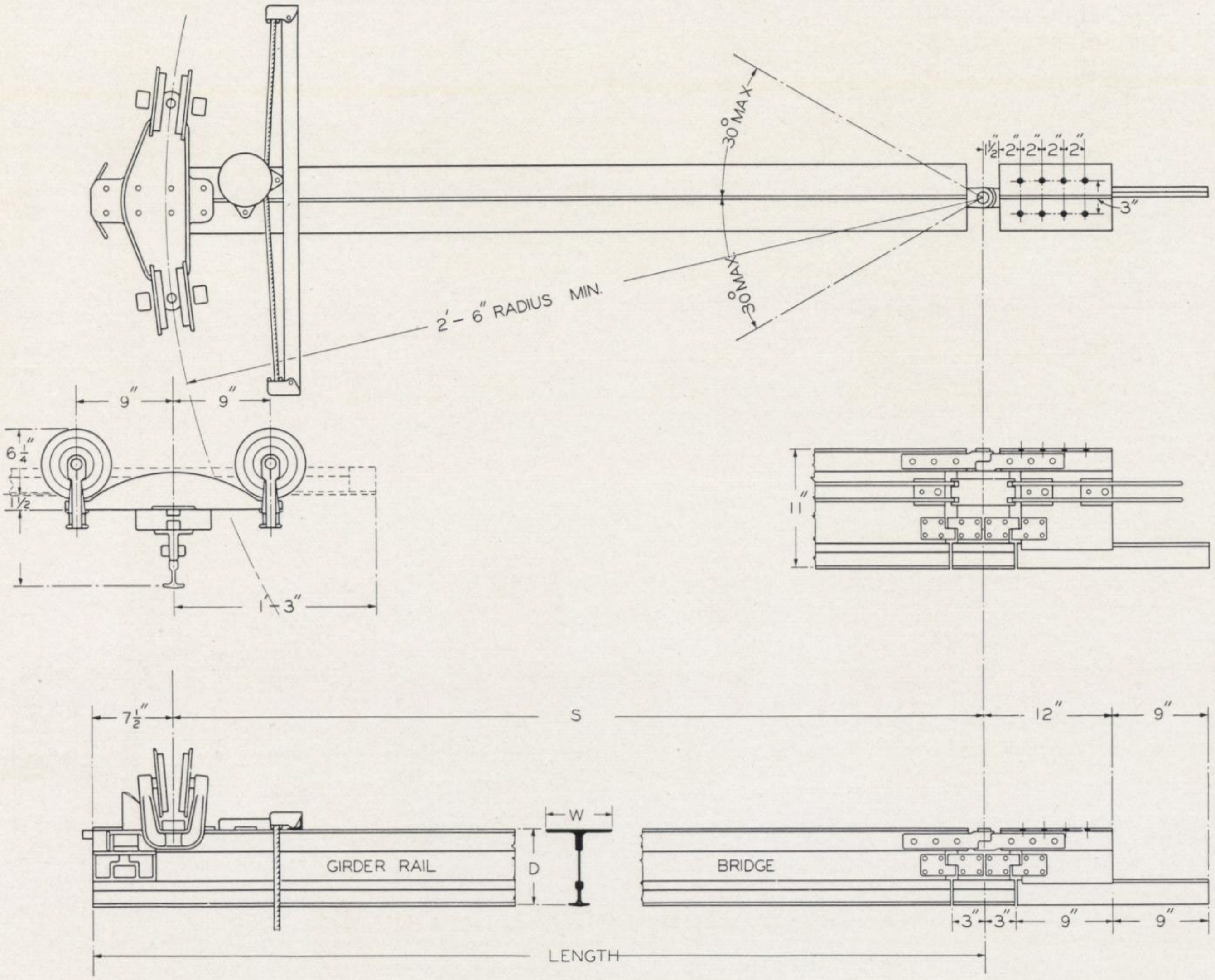


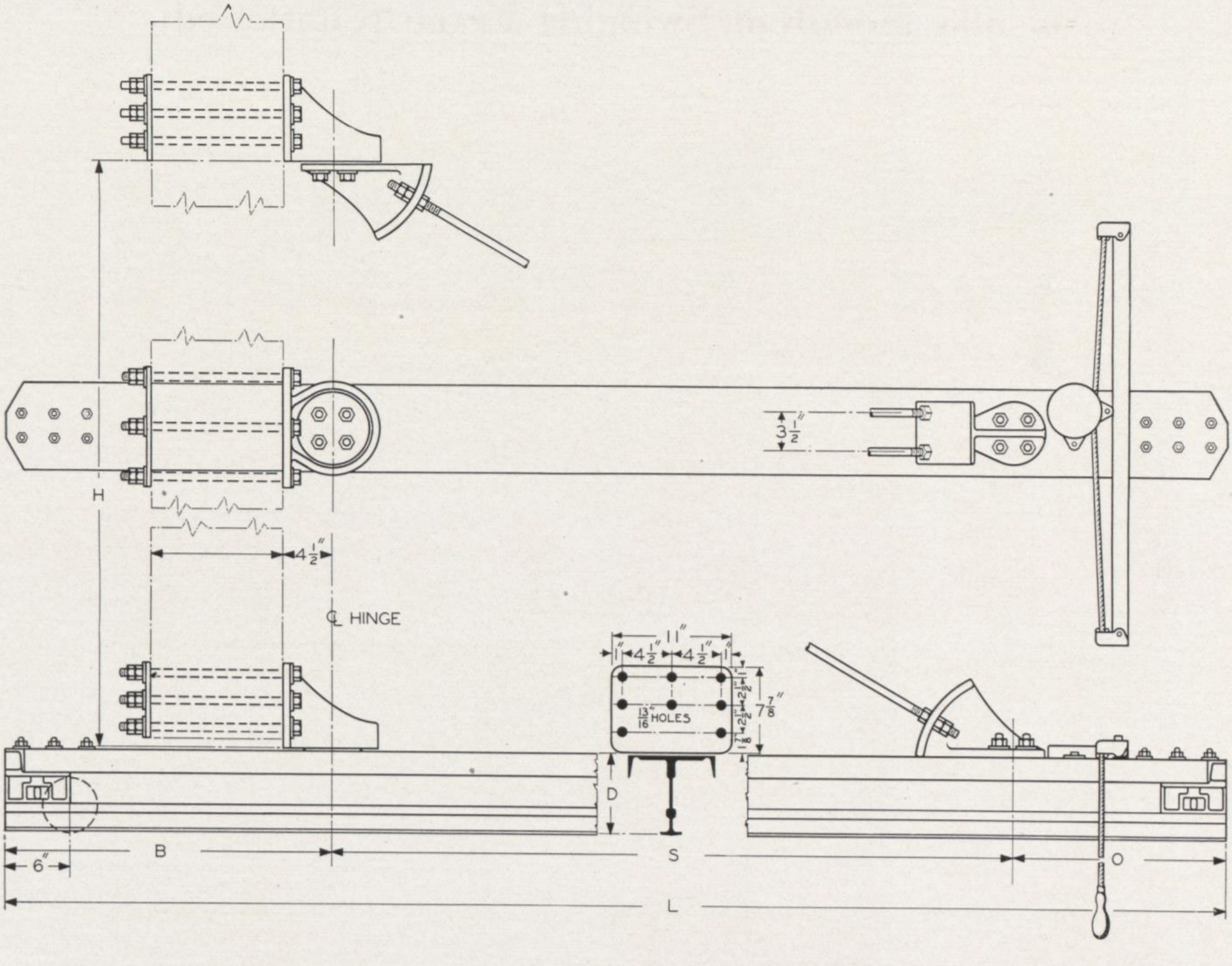
Fig. 109 *MonoRail Swinging Cranes in the plant of the Lebanon Steel Co., Lebanon, Pa.*

No. 583 MonoRail Swinging Crane (Continued)



ONE TON SWINGING CRANE

		Non-Electrified					Electrified			
		Non-Interlocking		Interlocking			Non-InterLocking		Interlocking	
Length in Feet	Depth of Bridge	Weight of Crane	Estimated Shipping Weight	Weight of Crane	Estimated Shipping Weight	Depth of Bridge	Weight of Crane	Estimated Shipping Weight	Weight of Crane	Estimated Shipping Weight
10′	7″	255 lbs.	300 lbs.	270 lbs.	350 lbs.	11″	330 lbs.	430 lbs.	350 lbs.	450 lbs.
12′	7″	290 lbs.	340 lbs.	305 lbs.	385 lbs.	11″	375 lbs.	475 lbs.	395 lbs.	500 lbs.
14′	7″	320 lbs.	370 lbs.	340 lbs.	420 lbs.	11″	425 lbs.	525 lbs.	440 lbs.	550 lbs.
16′	7″	355 lbs.	405 lbs.	370 lbs.	450 lbs.	11″	470 lbs.	570 lbs.	490 lbs.	600 lbs.
18′	9″	410 lbs.	460 lbs.	435 lbs.	525 lbs.	11″	520 lbs.	625 lbs.	540 lbs.	650 lbs.
20′	9″	450 lbs.	500 lbs.	470 lbs.	560 lbs.	11″	565 lbs.	670 lbs.	585 lbs.	700 lbs.
22′	9″	485 lbs.	540 lbs.	505 lbs.	595 lbs.	11″	615 lbs.	720 lbs.	635 lbs.	750 lbs.
24′	11″	600 lbs.	660 lbs.	615 lbs.	710 lbs.	11″	665 lbs.	775 lbs.	685 lbs.	800 lbs.
26′	11″	640 lbs.	700 lbs.	655 lbs.	750 lbs.	11″	710 lbs.	820 lbs.	730 lbs.	850 lbs.
28′	11″	680 lbs.	745 lbs.	700 lbs.	800 lbs.	11″	760 lbs.	870 lbs.	780 lbs.	900 lbs.



No. 1813 Monorail Swinging Jib

Specifications

Jib Boom: Girder Rail.
Hinges and Brackets: Steel Castings.
Hinge Bearings: Roller, equipped for Zerk-Alemite Lubrication.
Finish: Green Enamel.
May be equipped to interlock with connecting track at either end.

The American MonoRail Swinging Jib is designed for material handling in the following situations:

- Mounted on post or column to cover a definite floor area;
- To distribute traffic to a series of radiating tracks, with which it interlocks; or
- To swing over receiving or loading platforms where the crane operates through a doorway. When crane is not in use it swings to clear the doorway. In this case it may be made to interlock with tracks inside the building.

Thrust loads on heavy type jib hinges are taken by roller bearings equipped for pressure lubrication. Design and construction throughout are consistent with the standards set up for all MonoRail equipment.

Recommendations and quotations will be given when we are furnished with information on load, height (H), length (L), and whether interlocking or non-interlocking type is required. Also note whether or not overhang (B) is required at hinge end. The greater the height (H), the less the stresses, and the less the cost will be.

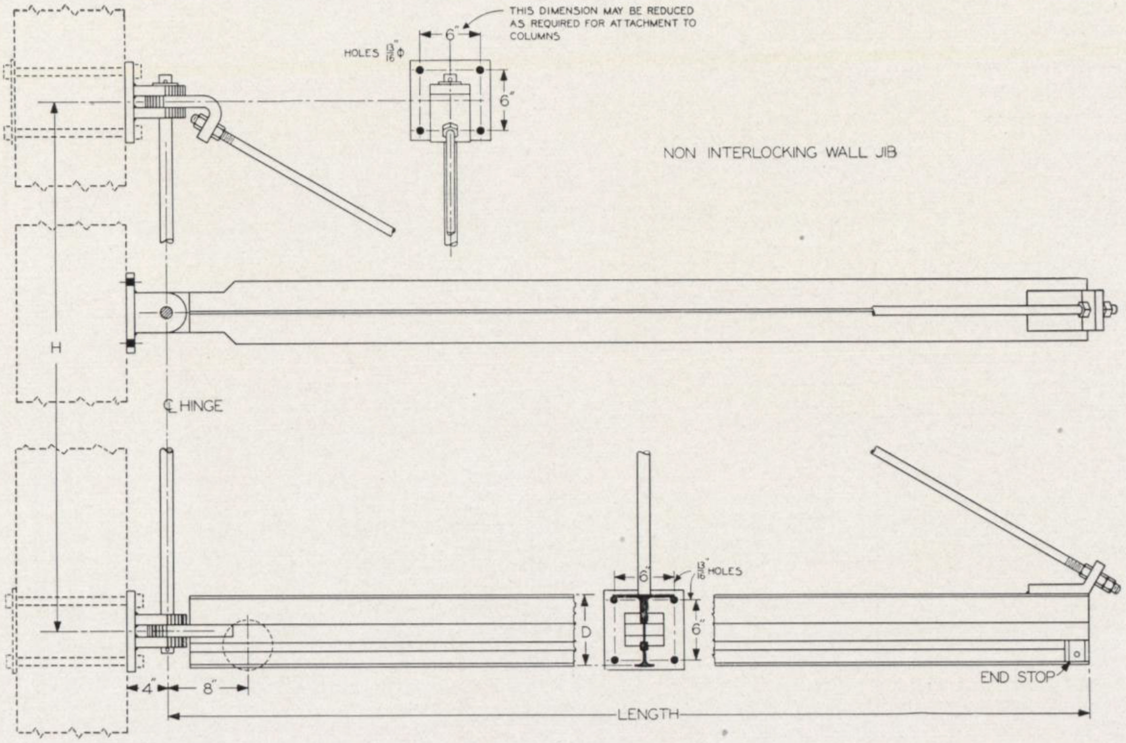
Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

No. 1822 Non-Interlocking MonoRail Swinging Jib.
No. 1823 Interlocking MonoRail Swinging Jib.

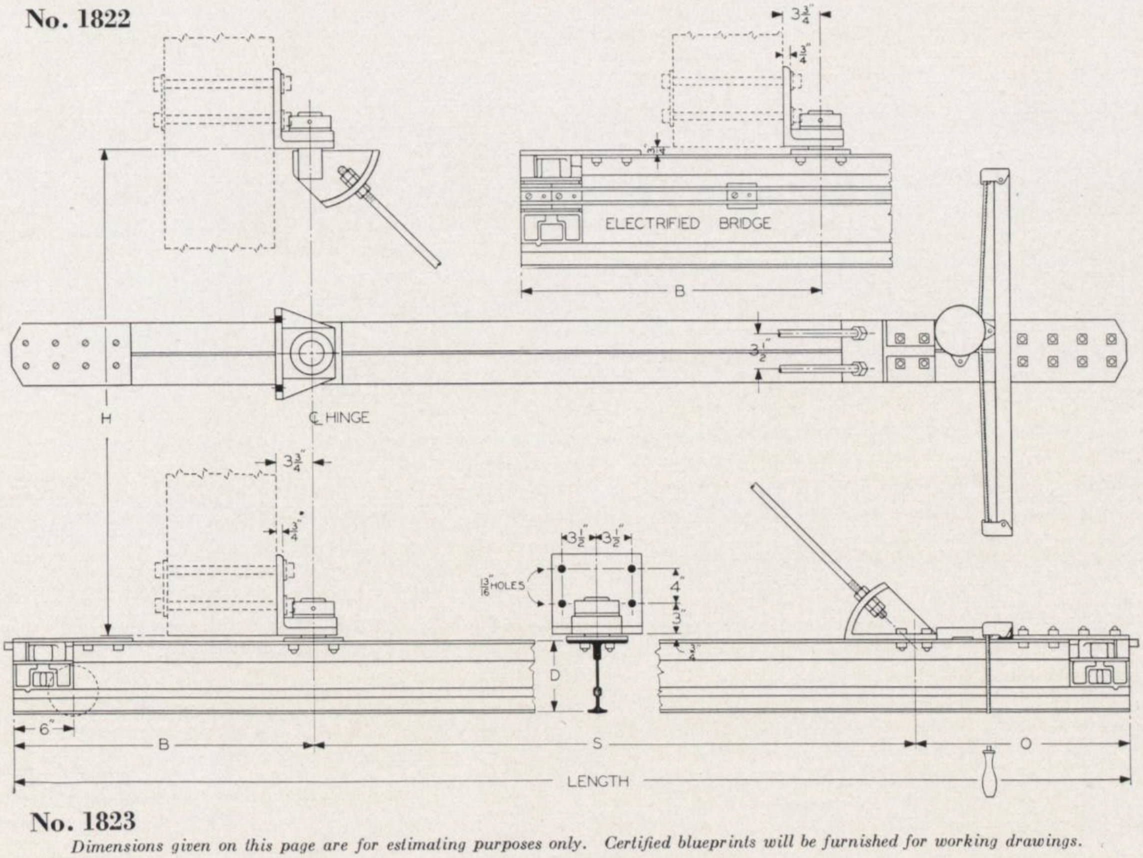
Below are shown two standard forms of jibs for shorter radii and lighter loads, or both.

The upper drawing shows a non-interlocking type.

The lower drawing is of an interlocking type similar to the one on the preceding page, but for lighter stresses in the hinges and brackets.

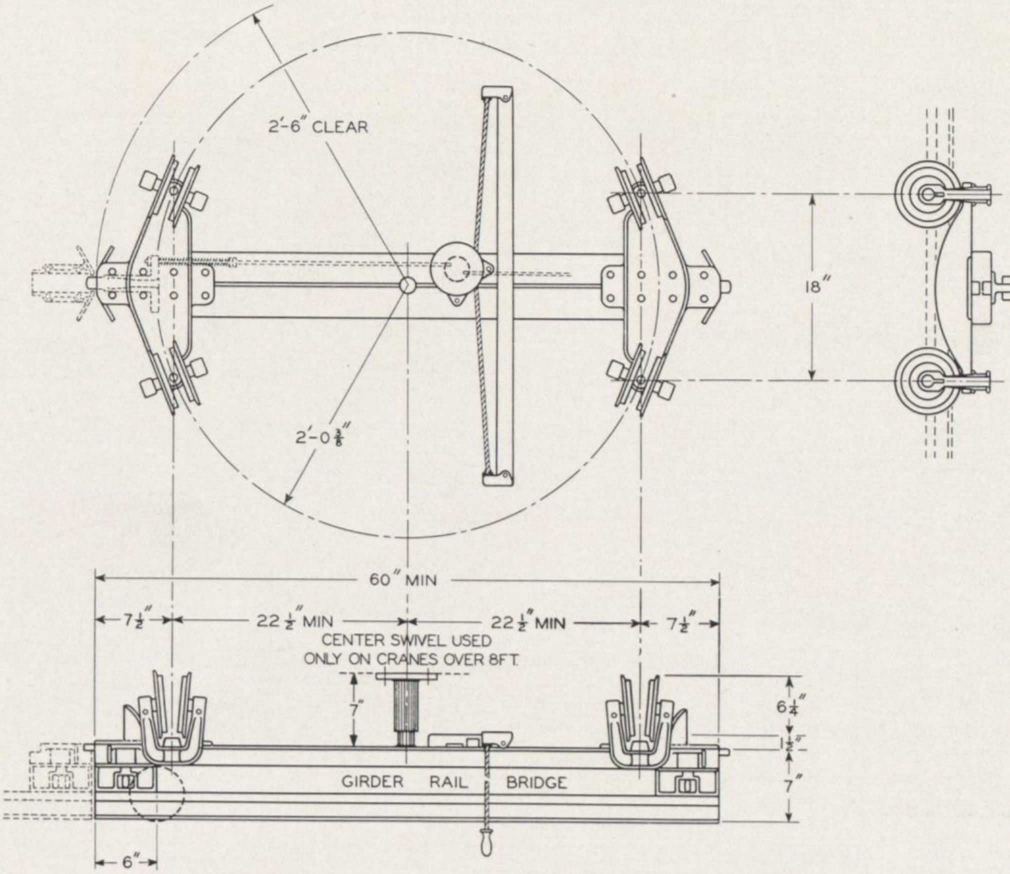

THIS DIMENSION MAY BE REDUCED AS REQUIRED FOR ATTACHMENT TO COLUMNS
HOLES 13/16" φ
6"
6"
NON INTERLOCKING WALL JIB
H
℄ HINGE
6"
13/16" HOLES
D
6"
END STOP
4"
8"
LENGTH

No. 1822



No. 1823

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 560 Swiveling Crane

Specifications

Crane Bridge: Girder Rail.

Crane Trucks: Malleable Castings.

Wheels: Drop Forgings with New Departure High Duty Precision Ball Bearings.

Yokes: Malleable Castings.

Crane Runway: Standard MonoRail.

Finish: Green Enamel.

Lubrication: Alemite-Zerk.

The American MonoRail Swiveling Crane is a true crane in type which travels on a circular runway, and performs the function of a turntable.

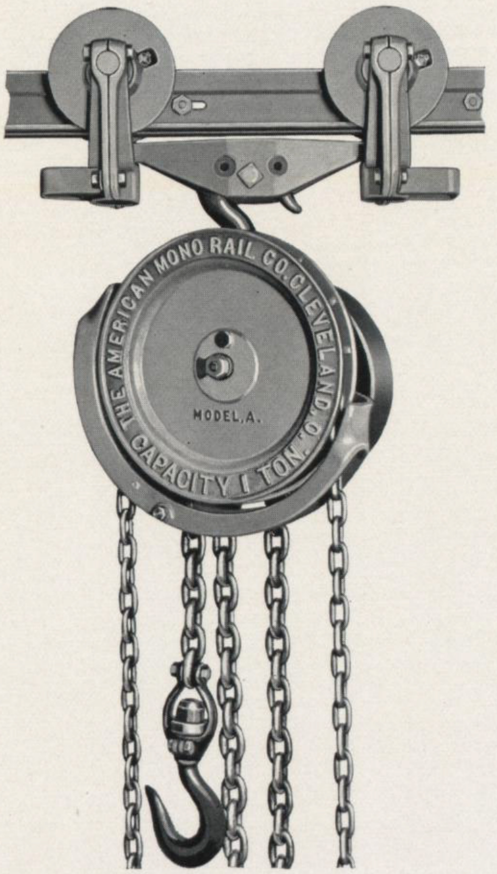
The swiveling crane is designed to serve a number of radiating tracks, the minimum permitted spacing at interlocks being seven inches.

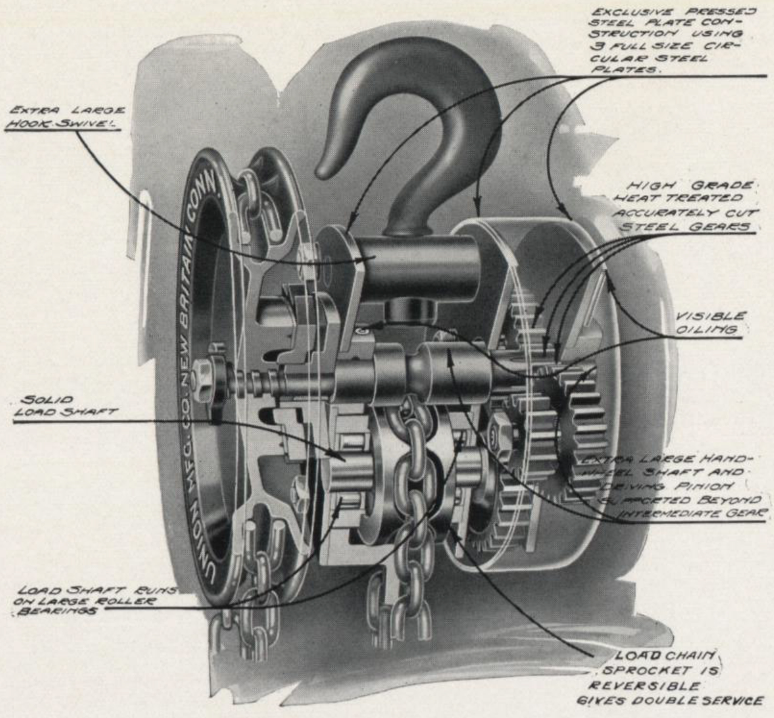
Full load bearing capacity of one ton is guaranteed by the design and construction of this crane, standard MonoRail track supplying the runway. The crane trucks are mounted on standard MonoRail crane yoke and wheel assembly, while American Girder Rail is used for the crane bridge.

Safety devices protect both crane and connecting tracks when open.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

No. 616 American MonoRail Chain Hoist




EXCLUSIVE PRESSED STEEL PLATE CONSTRUCTION USING 3 FULL SIZE CIRCULAR STEEL PLATES.
EXTRA LARGE HOOK SWIVEL
HIGH GRADE HEAT TREATED ACCURATELY CUT STEEL GEARS
VISIBLE OILING
SOLID LOAD SHAFT
EXTRA LARGE HANDWHEEL SHAFT AND DRIVING PINION SUPPORTED BEYOND INTERMEDIATE GEAR
LOAD SHAFT RUNS ON LARGE ROLLER BEARINGS
LOAD CHAIN SPROCKET IS REVERSIBLE GIVES DOUBLE SERVICE
UNION MFG. CO. NEW BRITAIN CONN.

An efficient spur gear chain hoist offering the following advantages among many:

1. ROLLER BEARINGS. Load is supported on large roller bearings enclosed in cages.

2. GEARS. Accurately cut, highest quality, heat treated alloy steel gears.

3. HIGH SPEED. Less hand chain handled to lift load a given height.

4. DRIVING PINION. Driving pinion and shaft operating in its own plane is heavier and stronger than one operating through load shaft.

5. LOAD SHAFT. Load shaft is solid. Permits use of larger, stronger driving shaft.

6. DUST PROOF. Dust-proof cases enclose all friction members and gear train.

7. OILING. Visible, self-closing and cleaning oilers conduct the lubricant to the required places.

8. ALL STEEL. Solid pressed steel suspension system.

9. STRONGER. Exclusive pressed steel plate construction. Three full sized plates carry load friction units and gear train.

10. CHAIN. Special high carbon steel, electrically welded and heat treated.

11. BALL BEARING HOOKS. Ball bearing bottom hooks are equipped with detachable swivel.

12. LOAD SPROCKET. Reversible, keyed to solid steel load axle. Heat treated.

13. SAFE HOOKS. Heat treated forged hooks will open gradually under greatly excessive overload, giving sufficient time to lower a load in safety.

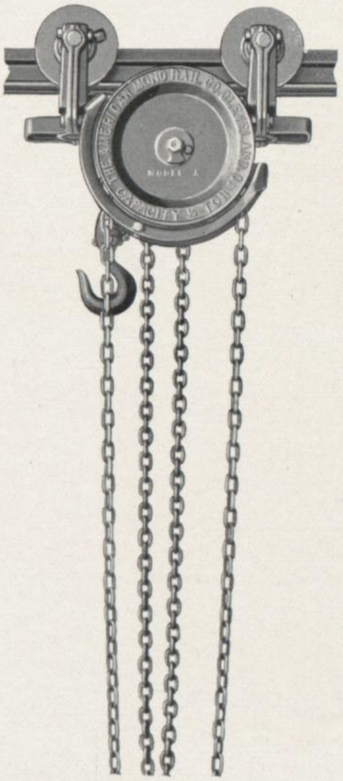
14. TESTED. Each hoist is tested to 50% and more overload.

15. CHAIN GUIDES. Greatly improved one piece malleable iron hand chain guide. Will not foul. Permits operation from any angle. Chain easily removable without detaching guide.

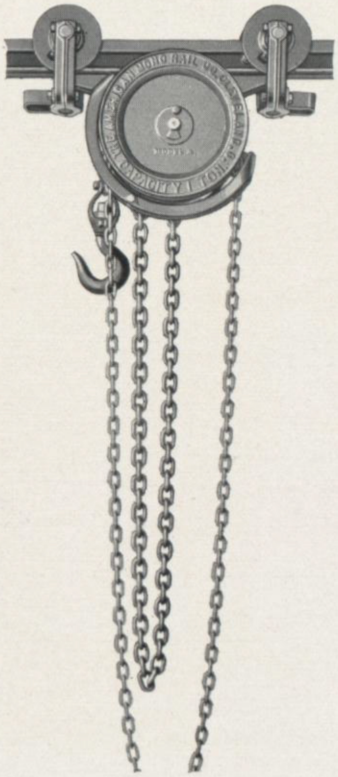
Capacity In Pounds	500	1000	2000	3000	4000
Lift In Feet	8	8	8	8	9
Net Weight	50 lb.	55 lb.	87 lb.	113 lb.	133 lb.
Shortest Distance Between Hooks	15″	15″	17½″	18½″	21″
Reach In Feet And Inches	9′-3″	9′-3″	9′-5½″	9′-6½″	10′-9″
Pull On Hand Chain To Lift Full Load	54 lb.	64 lb.	87 lb.	110 lb.	136 lb.
Chain Overhaul to Lift One Foot	11″	19″	26½″	33½″	36½″

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

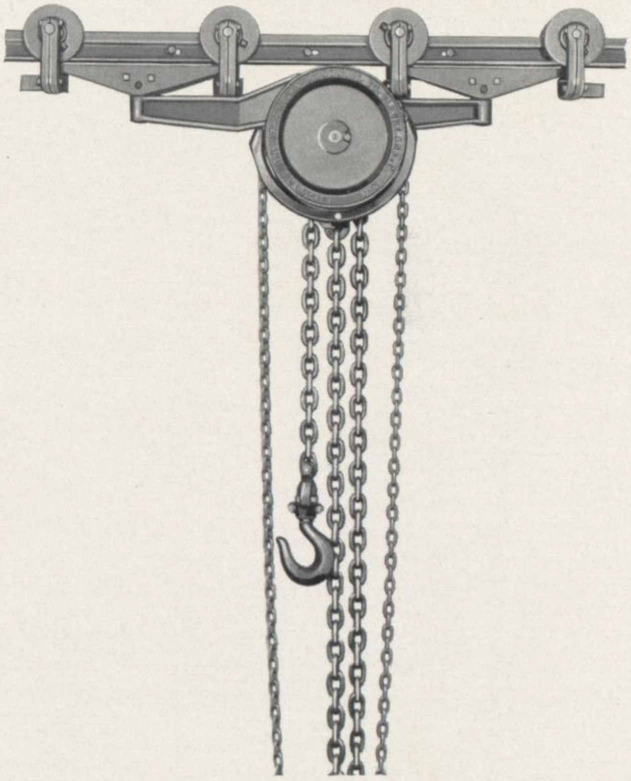
MonoRail Chain Hoists in Close Headroom Hook-Ups



No. 635



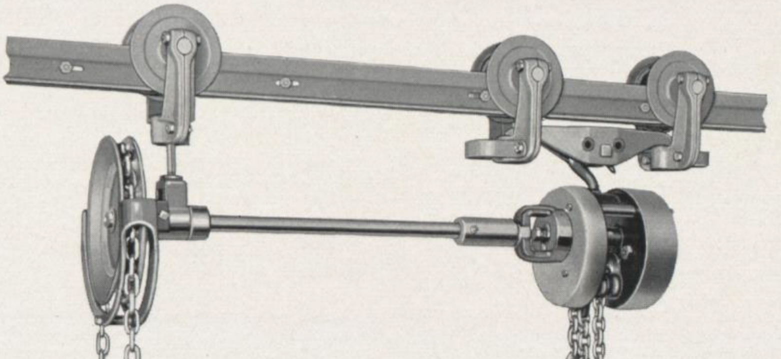
No. 636



No. 637

Where headroom is limited and where it is not necessary to swivel the hoist, five to seven inches of headroom may be gained by using the close hookup illustrated above. Hoists from left to right have lifting capacities as follows: **No. 635** *1000 pounds,* **No. 636** *2000 pounds and* **No. 637** *4000 pounds.*

No. 617 MonoRail Extended Hand Wheel Hoist



In this hoist the hand chain wheel is carried on an extended driving shaft for those cases where it is desirable or necessary for the operator to stand some distance from the load being handled. Specially adapted for handling ladles of melted metal or for the handling of enameled or varnished products where contact with the hand chain might injure the finish.

Standard extension is three feet, but this can be lengthened up to six feet, with free operation of trolleys on curves. This extension may also be used with the twin hook hoist.

Extended Hand Wheel Hoist

Capacity in Pounds	Standard Lift in Feet	Net Weight
1000	8	100 lbs.
2000	8	130 lbs.
3000	8	190 lbs.
4000	9	240 lbs.

No. 638

Burr Self-Locking Rope Hoist. A sturdy, convenient, easily portable, rope hoist. Self-locking under load.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Headroom Requirements for Chain Hoists

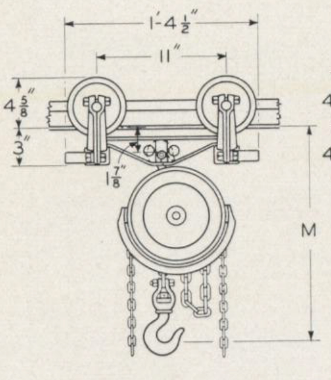


Fig. 116A

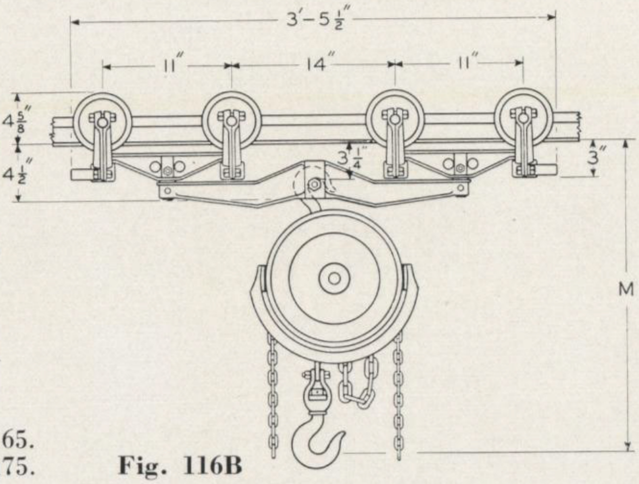


Fig. 116A Trolleys Nos. 162 and 165.
Fig. 116B Trolleys Nos. 171 and 175.

Fig. 116B

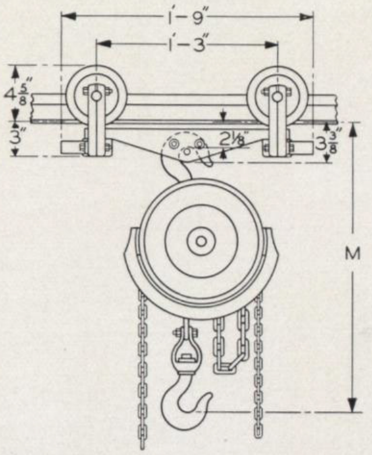


Fig. 116C

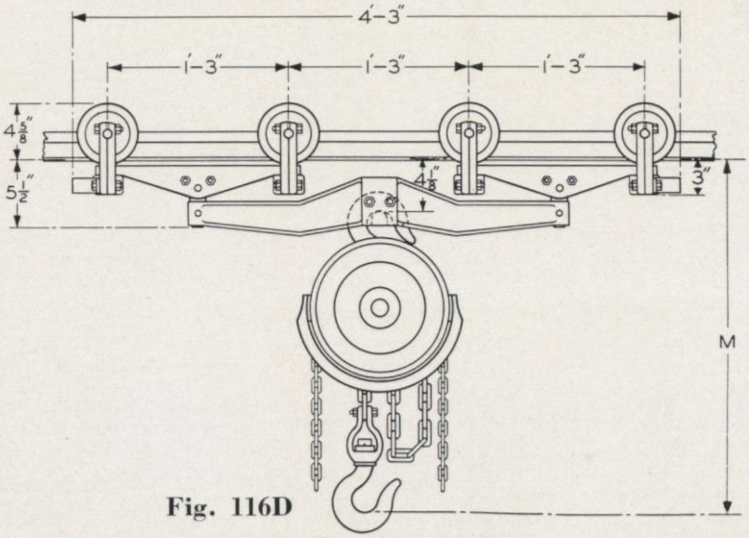


Fig. 116D

Fig. 116C Trolley No. 180.
Fig. 116D Trolley No. 181.

Distance "M" from Rail to Hook For Various Chain Hoists and Trolley Combinations

Hoist Capacity In Pounds	Trolley	American	Chisholm Moore	Reading	Wright	Yale & Towne	Ford	Superior Round	Robbins and Myers
500	162&165	16⅜	15⅞	13⅞	13⅞	14⅞	14⅞		13⅞
	180	16⅝	16⅛	14⅛	14⅛	15⅛	15⅛		14⅛
	171&175	17¾	17¼	15¼	15¼	16¼	16¼		15¼
1000	162&165	16⅜	16⅞	15⅞	13⅞	14⅞	14⅞	14⅞	13⅞
	180	16⅝	17⅛	16⅛	14⅛	15⅛	15⅛	15⅛	14⅛
	171&175	17¾	18¼	17¼	15¼	16¼	16¼	16¼	15¼
2000	180	19⅝	19⅛	17⅞	17¾	18⅛	18⅛	18⅛	17¾
	171&175	20¾	20¼	18⅛	18¾	19¼	19¼	19¼	18¾
	181	21⅝	21⅛	19¼	19⅝	20⅛	20⅛	20⅛	19⅝
3000	171	21¾	22¼	24¼	20¼	21¼	21¼	21¼	20¼
	181	22⅝	23⅛	25⅛	21⅛	22⅛	22⅛	22⅛	21⅛
4000	181	25⅛	25⅛	25⅛	25⅛	25⅛	25⅛	25⅛	25⅛

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

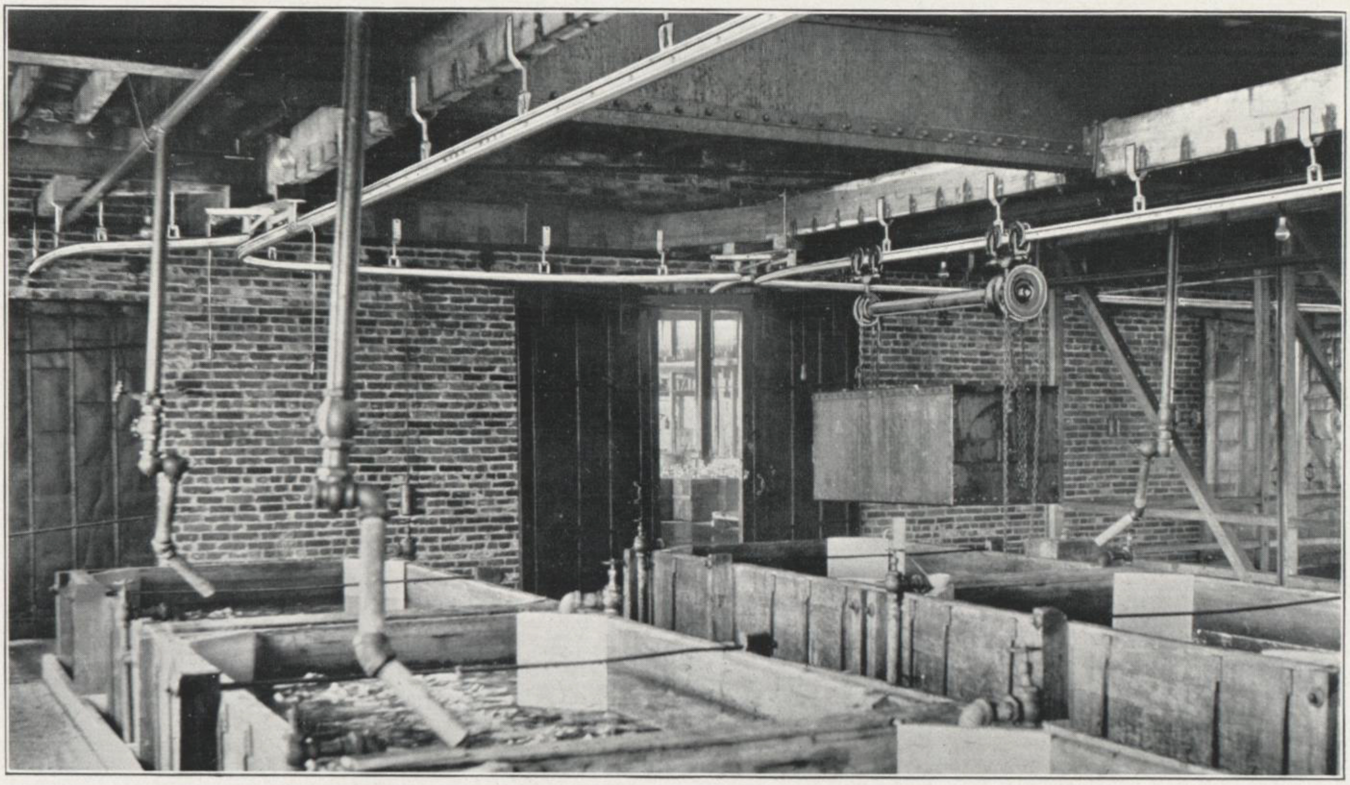


Fig. 117A *MonoRail handling system in the plant of the Atlantic Gelatine Company at Woburn, Mass. This equipment was udylited throughout to resist corrosion. Twin Hook hoist used to handle tanks.*

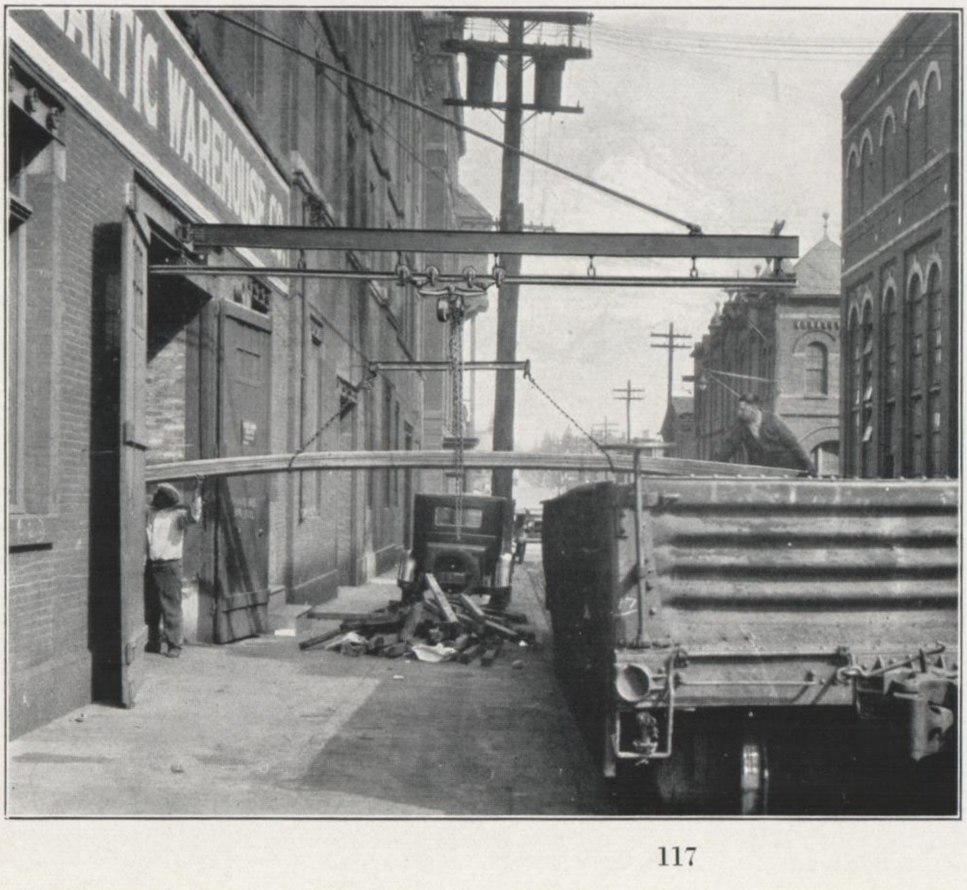
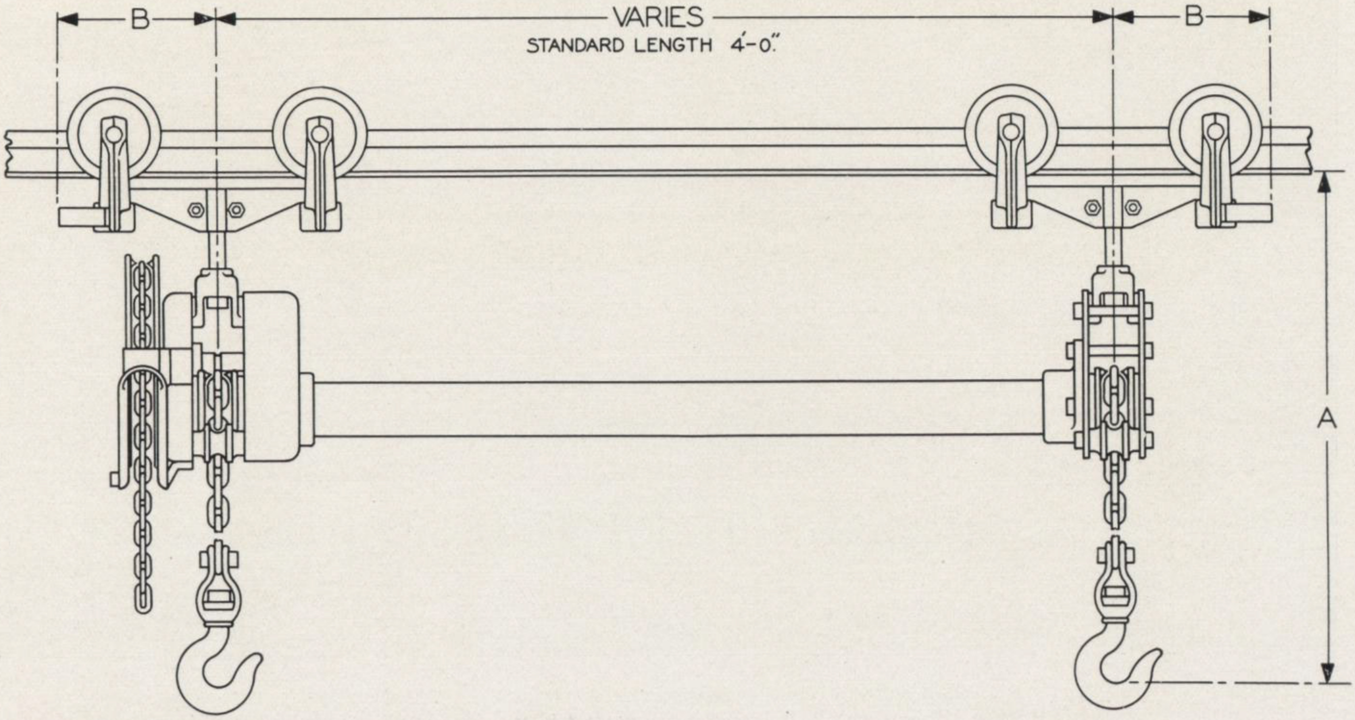


Fig. 117B *MonoRail jib crane used by Philips Bros. Steel Co., Philadelphia. Load of bar steel shown on crane weighed 1960 pounds. The jib is 19 feet in length and when not in use is swung back and fastened to the side of the building.*

No. 618 American MonoRail Twin-Hook Hoist

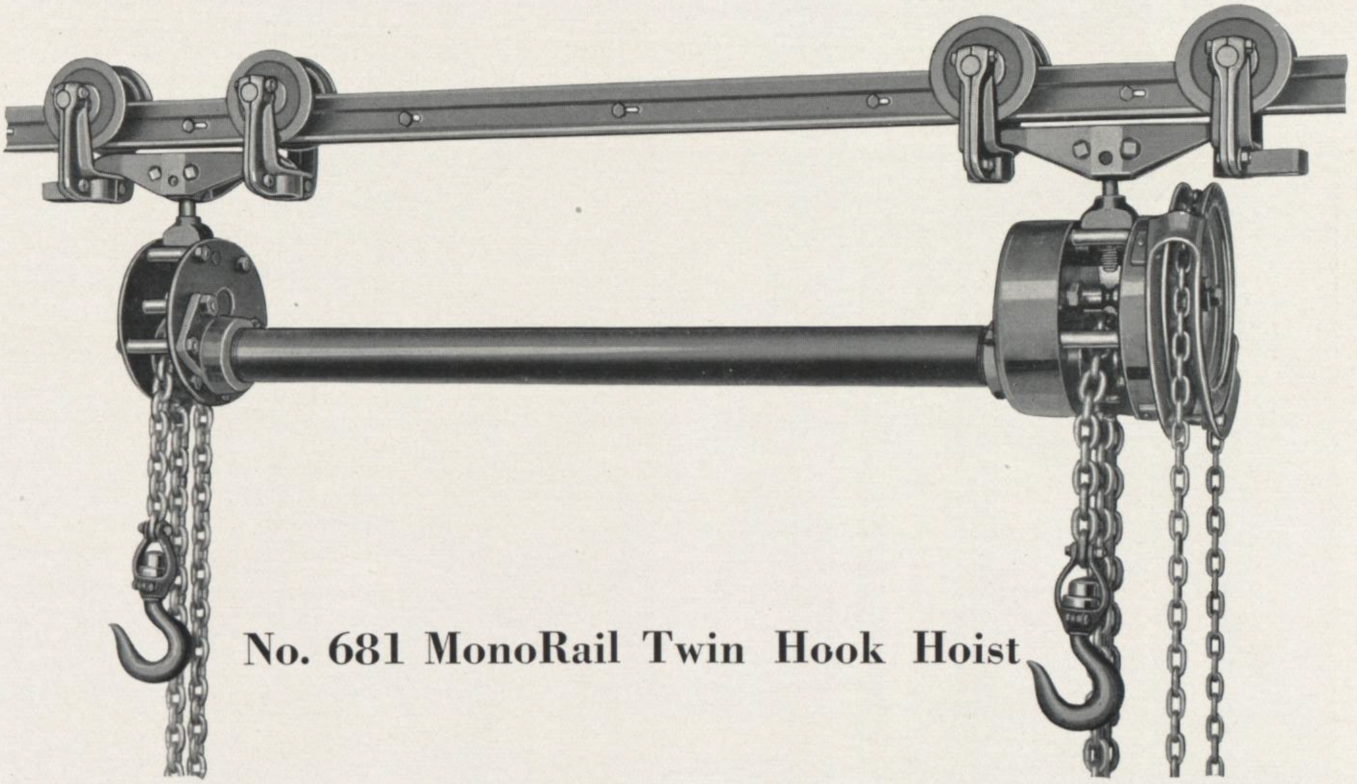


Twin Hook Hoists and Trolleys

Hoist Capacity In Pounds	Standard Lift In Feet	"A" Min. Headroom Hook To Rail	Number and Type Trolley	Weight Of Trolleys	Weight of Trolleys and Hoist
1000	8	16⅜	2—162	60 lb.	190 lb.
			2—165*	48 lb.	178 lb.
		16⅝	2—180	68 lb.	198 lb.
		17¾	2—171	150 lb.	280 lb.
			2—175	134 lb.	264 lb.
2000	8	19⅜"	2—162	60 lb.	270 lb.
			2—165*	48 lb.	258 lb.
		19⅝	2—180	68 lb.	278 lb.
		20¾	2—171	150 lb.	360 lb.
			2—175	134 lb.	344 lb
		21⅝	2—181	200 lb.	410 lb.
3000	8	20⅜	2—162*	60 lb.	410 lb.
		20⅝	2—180	68 lb.	418 lb.
		21¾	2—171	150 lb.	500 lb.
		22⅝	2—181	200 lb.	550 lb.
4000	9	23⅛	2—180*	68 lb.	598 lb.
		24¼	2—171	150 lb.	680 lb.
		25⅛	2—181	200 lb.	730 lb.

* Trolleys with proper capacity for given hoist.

Dimensions given on this page are for estimating purposes only. Certified blueprints wil be furnished for working drawings.



No. 681 MonoRail Twin Hook Hoist

Specifications

Capacities: 500 to 4000 pounds.
Composed of two hoisting units rigidly connected.
Gears: Alloy steel, accurately cut, heat treated.
Load Bearings: Large roller, packed in grease. Pressed steel plate construction.
Length: Standard 4 feet, center to center of load chains.
Finish: Green Enamel.
Special lengths furnished to order.
Lift: Standard, 8 feet.

This hoist is designed for loads where a two point lift is desirable or necessary as in the handling of automobile or truck bodies, buckets, or long material such as bars, pipe, sheets, lumber or posts.

Every possible inch of headroom is saved in this compact and sturdy twin hook hoist. The close hook up beween hoist and trolley brings the load hook to 16⅜ inches from the track in the ½ Ton hoist, and 25⅛ inches in the Two-Ton hoist.

The Twin Hook Hoist is made up of a standard spur gear hoist connected rigidly to another hoisting unit operated by a shaft. It is equipped with two load chains and one hand chain. In operation the rated capacity must be divided between the two load hooks. For example: with a one-ton hoist each hook will carry 1000 pounds.

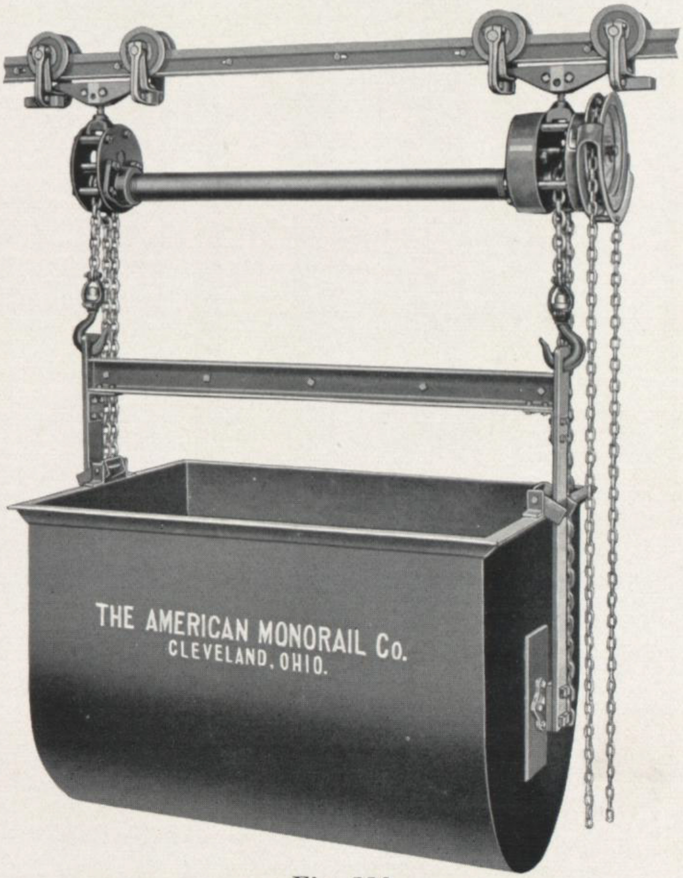
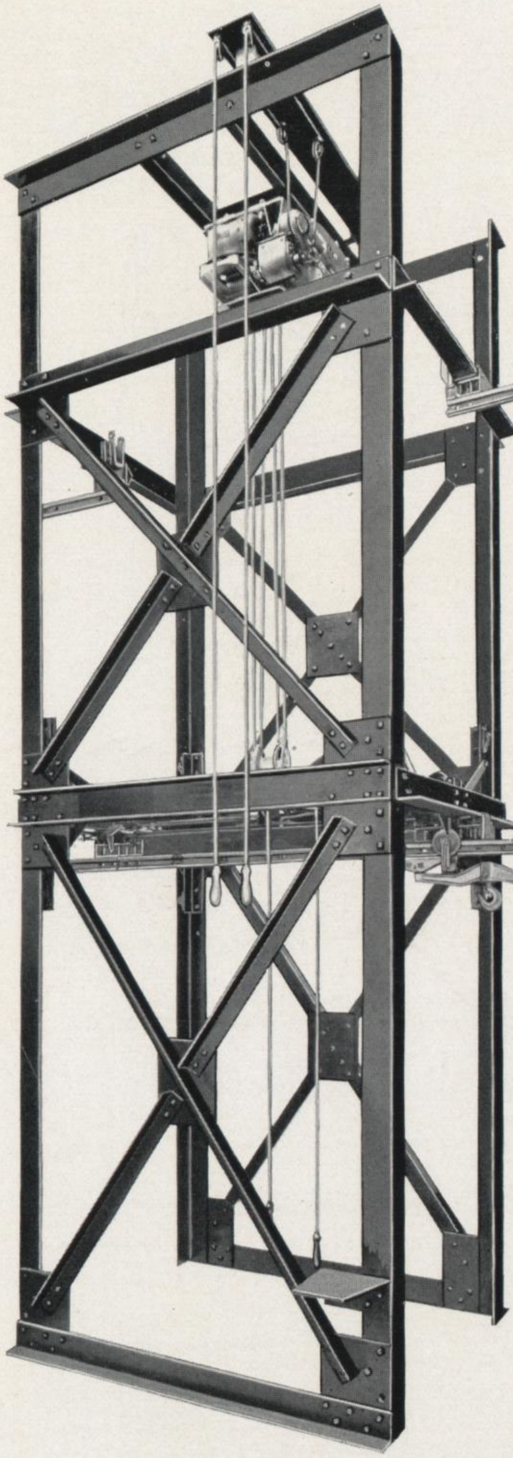
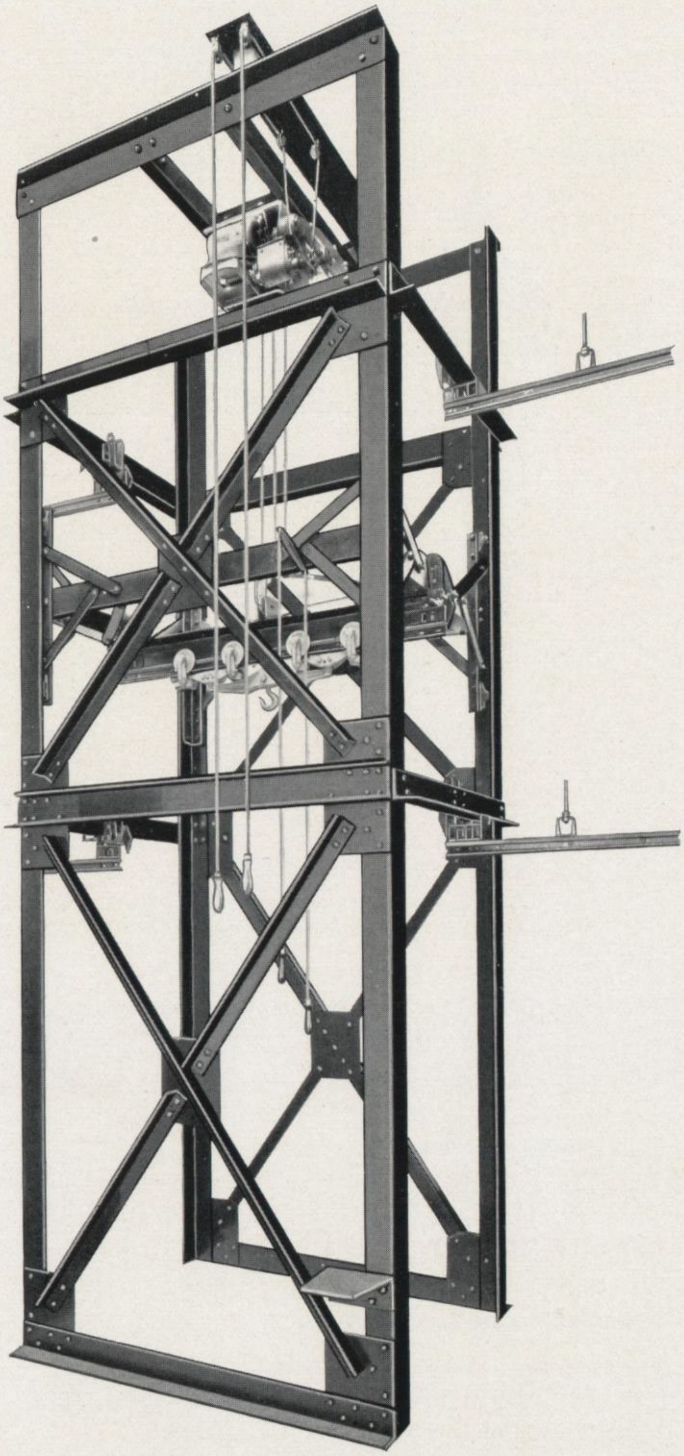

THE AMERICAN MONORAIL Co.
CLEVELAND, OHIO.

Fig. 119

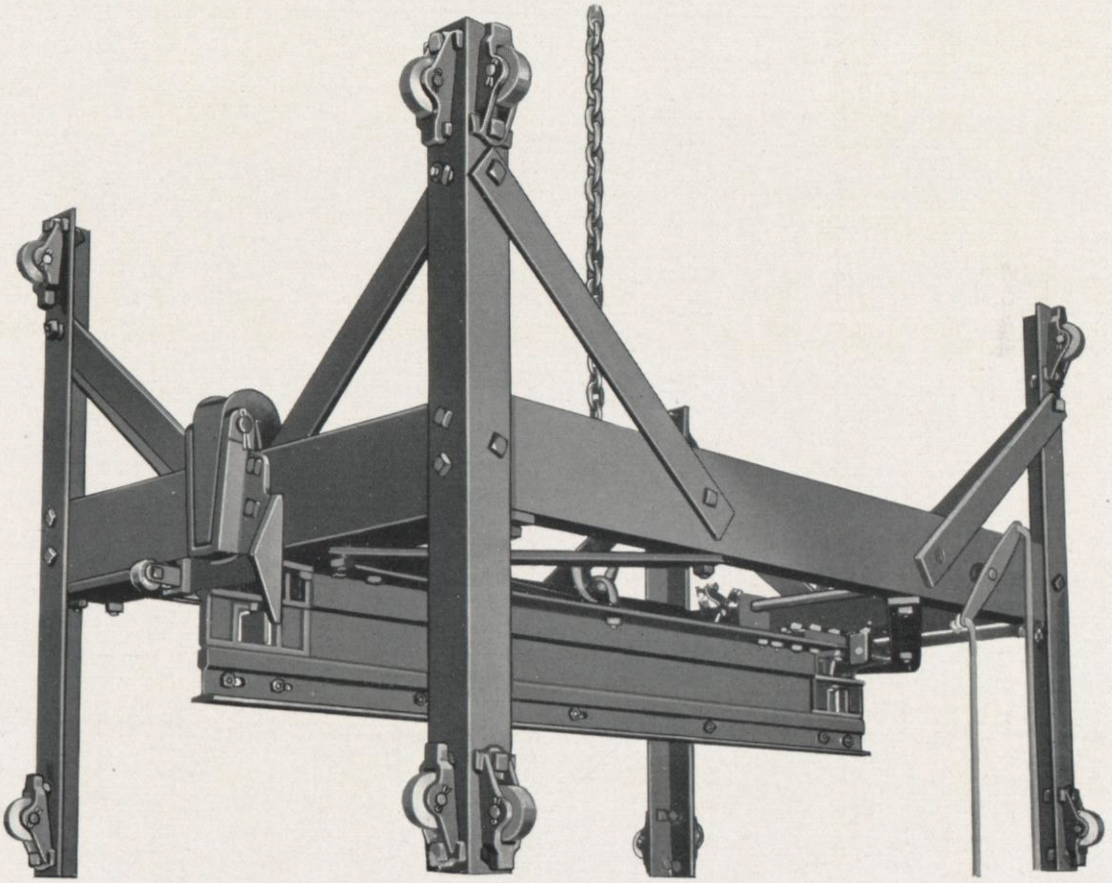


No. 650 —*Tower for MonoRail lift. Shows trolley entering lift.*



No. 650A —*Shows lift in operation. Lift section in mid-floor position.*

Towers for MonoRail Lifts are designed and fabricated to meet all requirements of load, size of trolley and racks, and special conditions in buildings in which they are to be erected. Constructed of structural steel, towers are shipped knocked down but may be readily assembled in the field, all parts being plainly marked for identification from accompanying blueprints. For typical applications see page 122.



No. 651 American MonoRail Lift

The American MonoRail Lift is a structural steel frame, carrying a section of Girder Rail, which travels in a vertical, rectangular, structural steel tower. **See pages 120 and 122.**

The towers carry the hoisting mechanism, and are equipped with stop latches and safety devices.

By means of the MonoRail lift loaded trolleys are carried from one level to another or from floor to floor. When the lift is aligned with connecting track the load is supported and the track held in accurate register by a positive stop latch. Alignment does not depend on the hoist cable.

Adjustable guide rollers hold the lift frame always in correct position regardless of the location of the trolley. They eliminate binding, reduce friction, and compensate for slight variations encountered in the fabrication of steel towers. Two point suspension for lift is necessary only on spans of 8 feet or more.

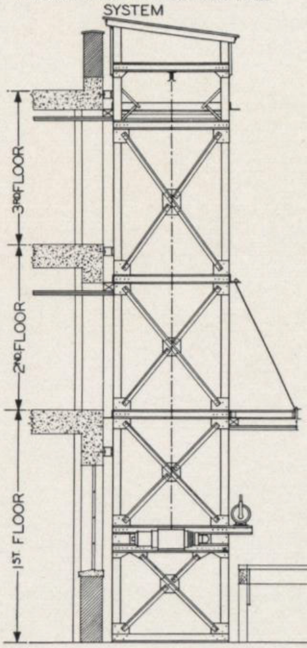
Electric or air hoist may be used, or where speed is not a requirement, a hand chain hoist may be used to operate the lift.

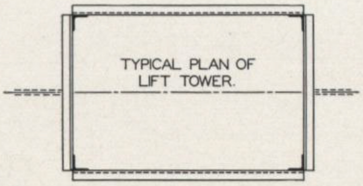
Automatic safety stops protect all open rail ends, making it impossible for trolleys to leave the track.

MonoRail lift towers may easily be enclosed for fire protection as MonoRail lends itself readily to the installation and operation of fire doors.

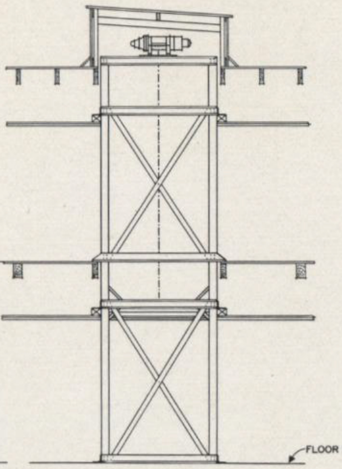
The application of American MonoRail lifts to a variety of situations is visualized by the illustrations below. See also description on preceding pages.

SHOWING OUTSIDE TYPE OF LIFT TOWER. ERECTED OUTSIDE BUILDING AND SERVING DIFFERENT FLOORS FROM AN OUTSIDE RAIL SYSTEM

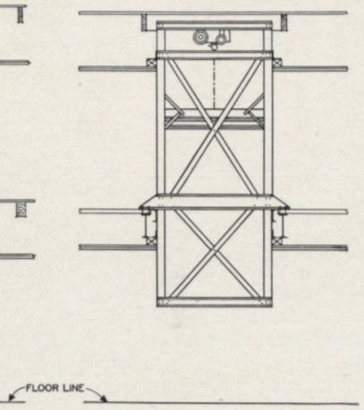


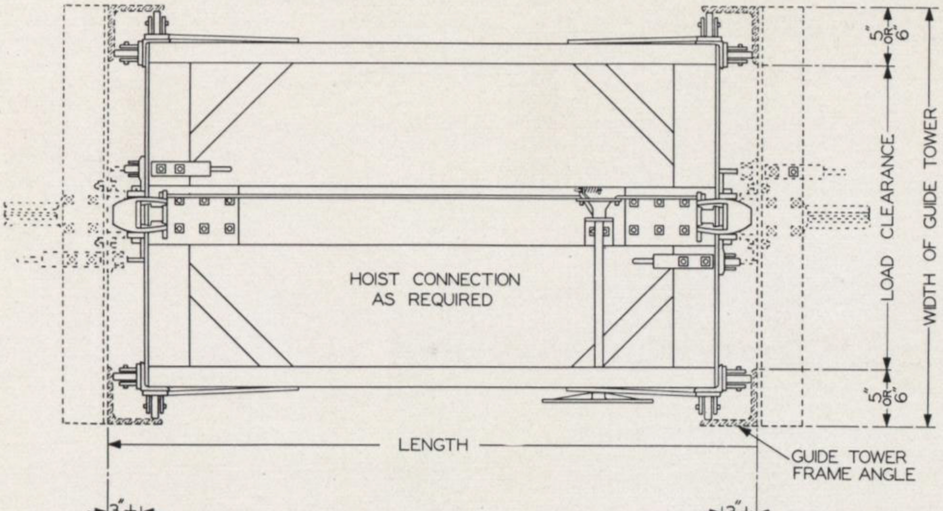


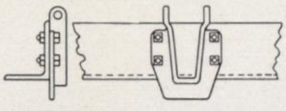
SHOWING LIFT TOWER SUPPORTED FROM FLOOR. AND HAVING PENT HOUSE TO ACCOMMODATE HOIST WHERE HEADROOM IS INSUFFICIENT.



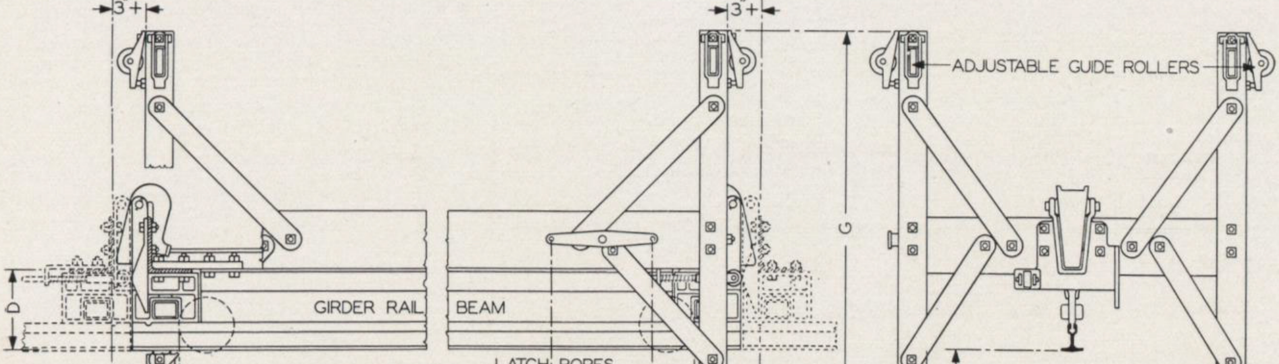
SHOWING LIFT TOWER SUPPORTED FROM ONE FLOOR AND EXTENDING TO MONORAIL SYSTEM IN STORY BELOW.







LIFT SUPPORT FOR DEAD ENDS

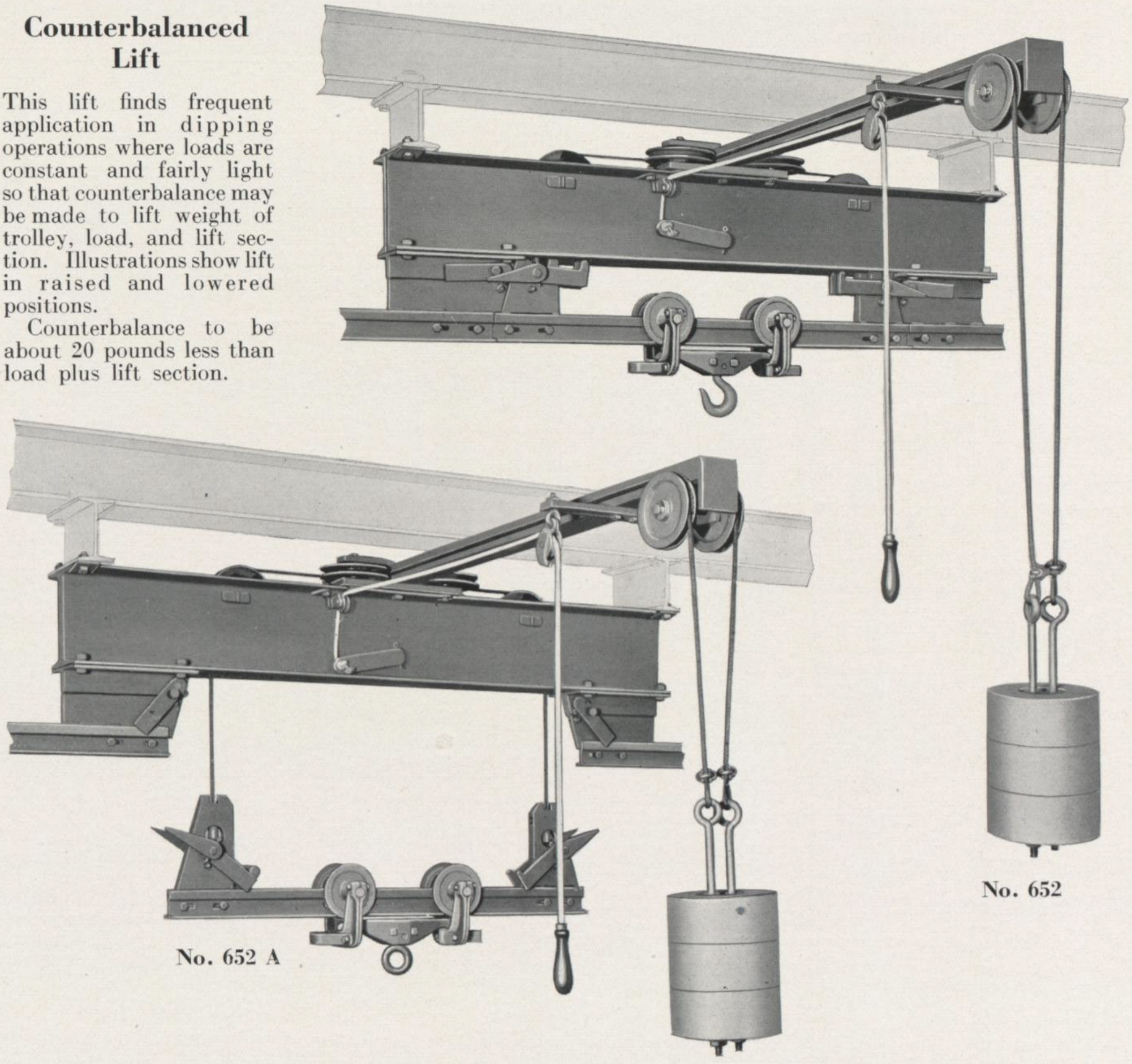


Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Counterbalanced Lift

This lift finds frequent application in dipping operations where loads are constant and fairly light so that counterbalance may be made to lift weight of trolley, load, and lift section. Illustrations show lift in raised and lowered positions.

Counterbalance to be about 20 pounds less than load plus lift section.



No. 652

No. 652 A

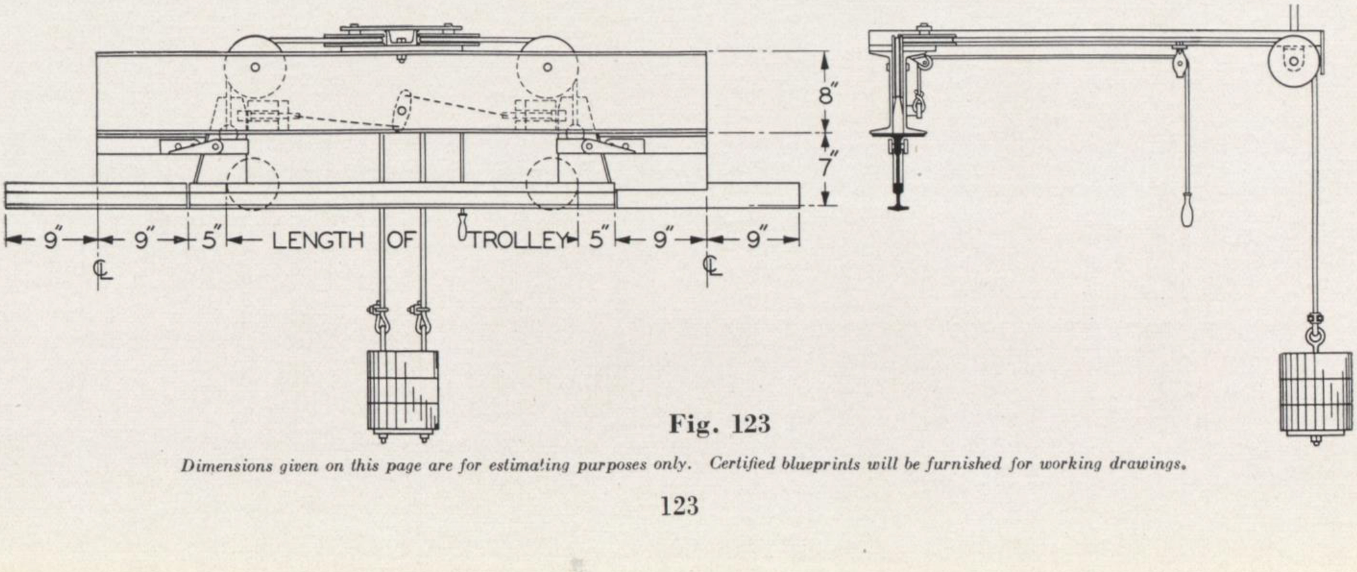
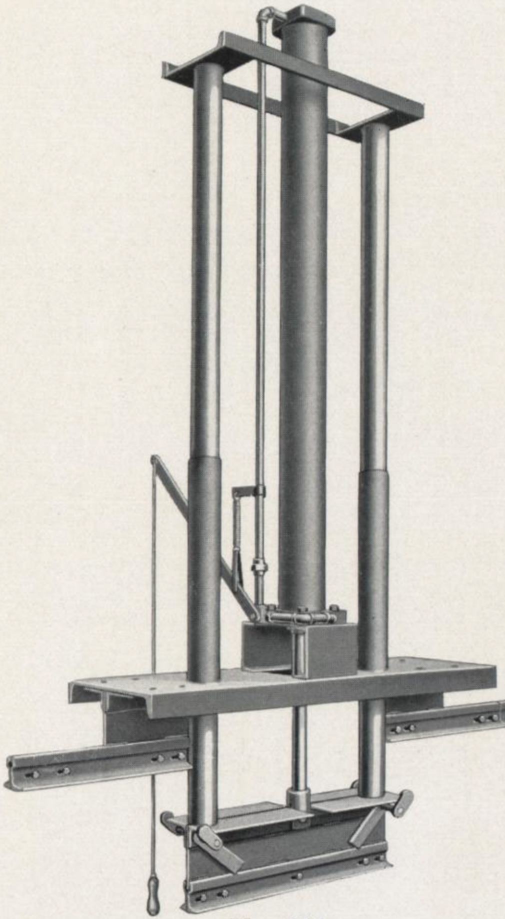


Fig. 123

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 653

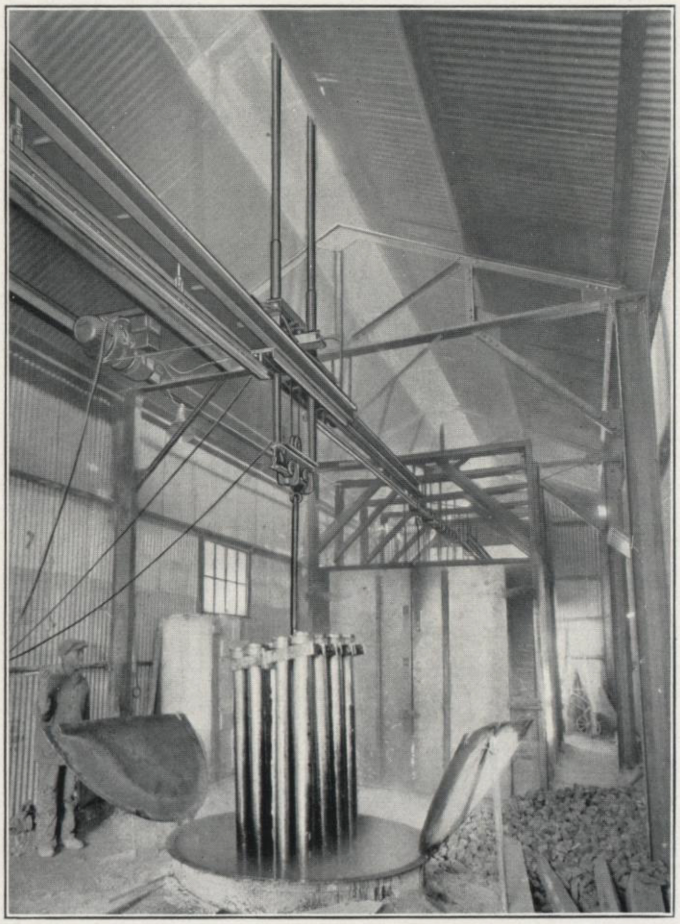


Fig. 124B

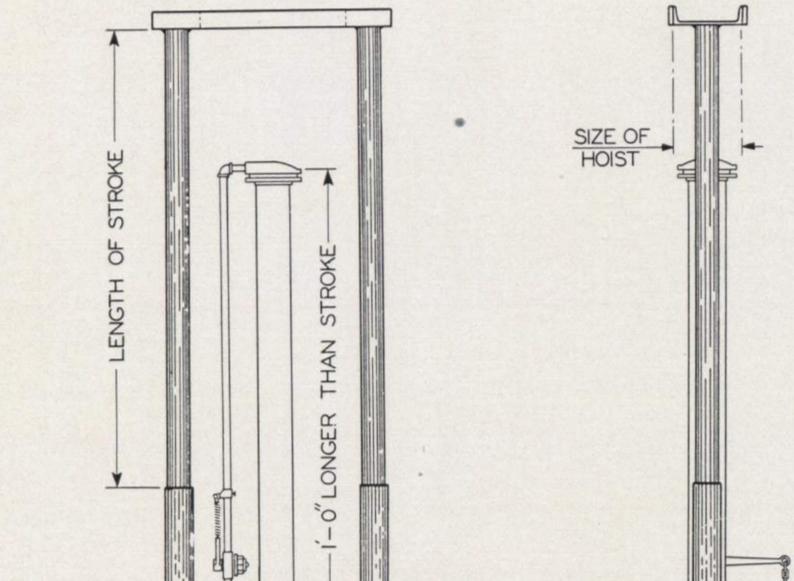


Fig. 124A

Air Lifts

Air being available for lifting purposes in so many plants, the air lift, No. 653, finds frequent application to lifting or dipping operations.

This type of lift is well suited to rapid dipping operations where the materials to be dipped are hung from trolley or from short rack.

Variations and modifications of this type of lift will be found on pages 149 and 153.

The illustration above, Fig. 124B, shows a similar unit except that it is operated by an electric hoist instead of an air cylinder. This unit is in the plant of the Buffalo Pipe & Foundry Company, Buffalo, New York.

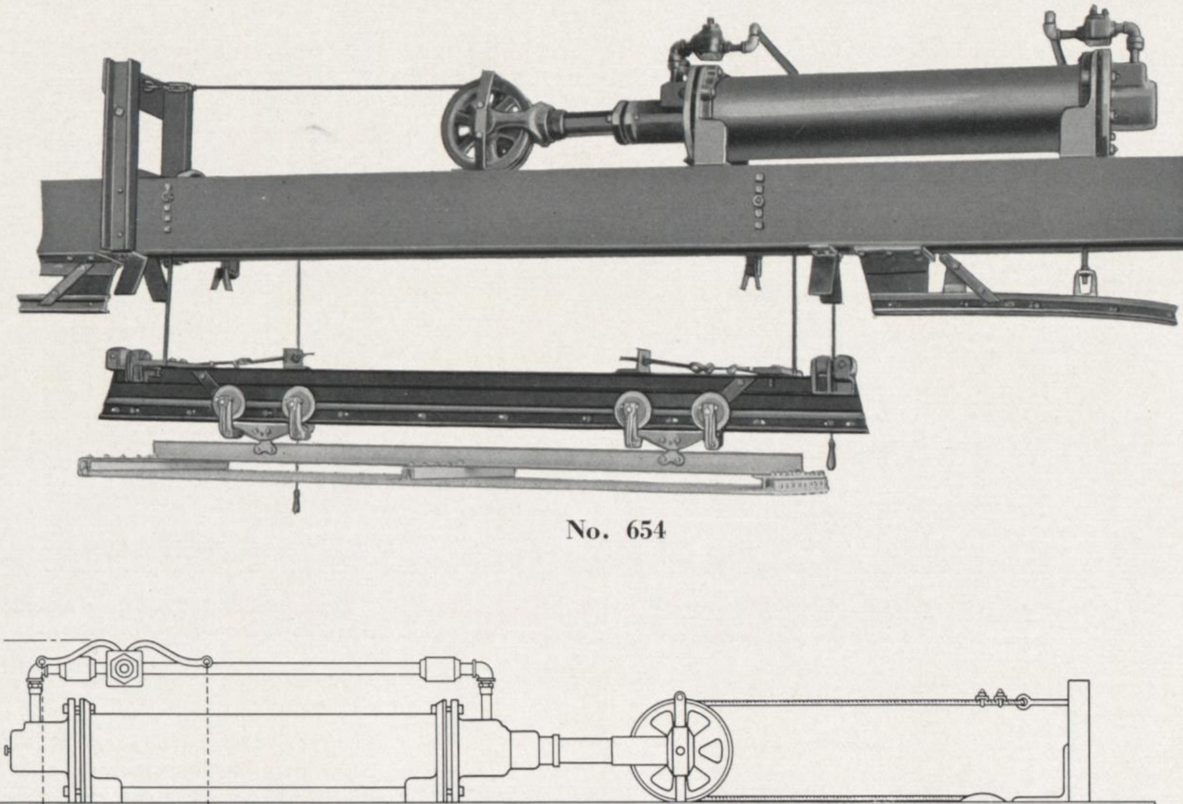
For additional information on lifting and dipping machines see pages 186 and 188.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Dipping Machines

The standard MonoRail Dipping Machine shown below finds application in many situations when lifting and dipping equipment is a necessary part of a MonoRail System. Where conditions cannot be met by standard design, modifications or new designs may be necessary. See pages 186 and 187 for such modifications.

This installation is in the plant of the Olean Metal Cabinet Works, Olean, New York.



No. 654

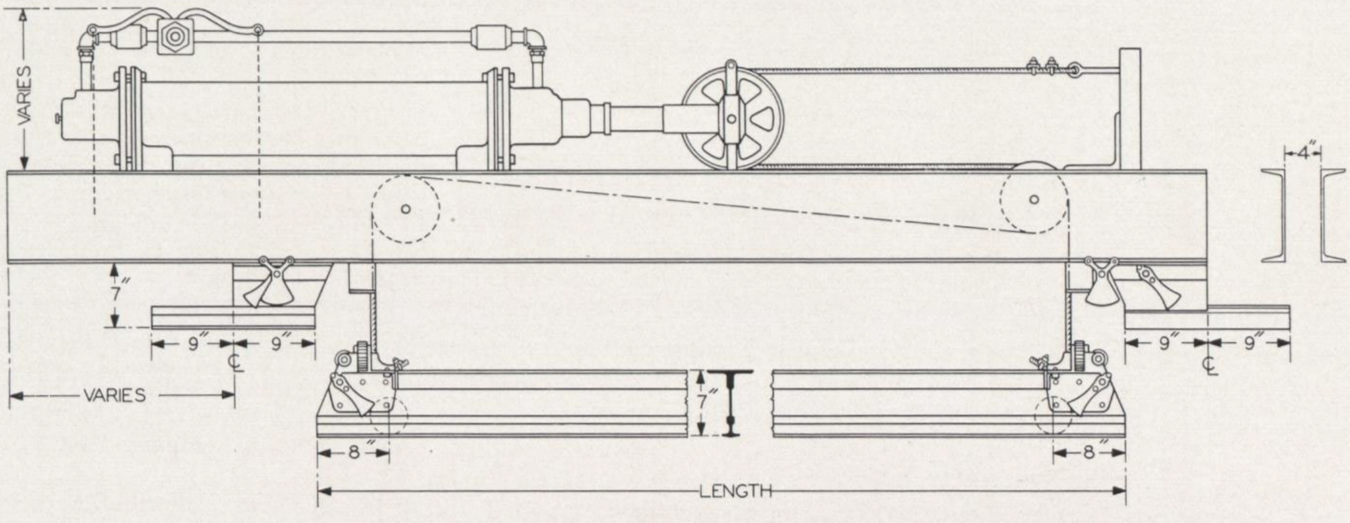


Fig. 125

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

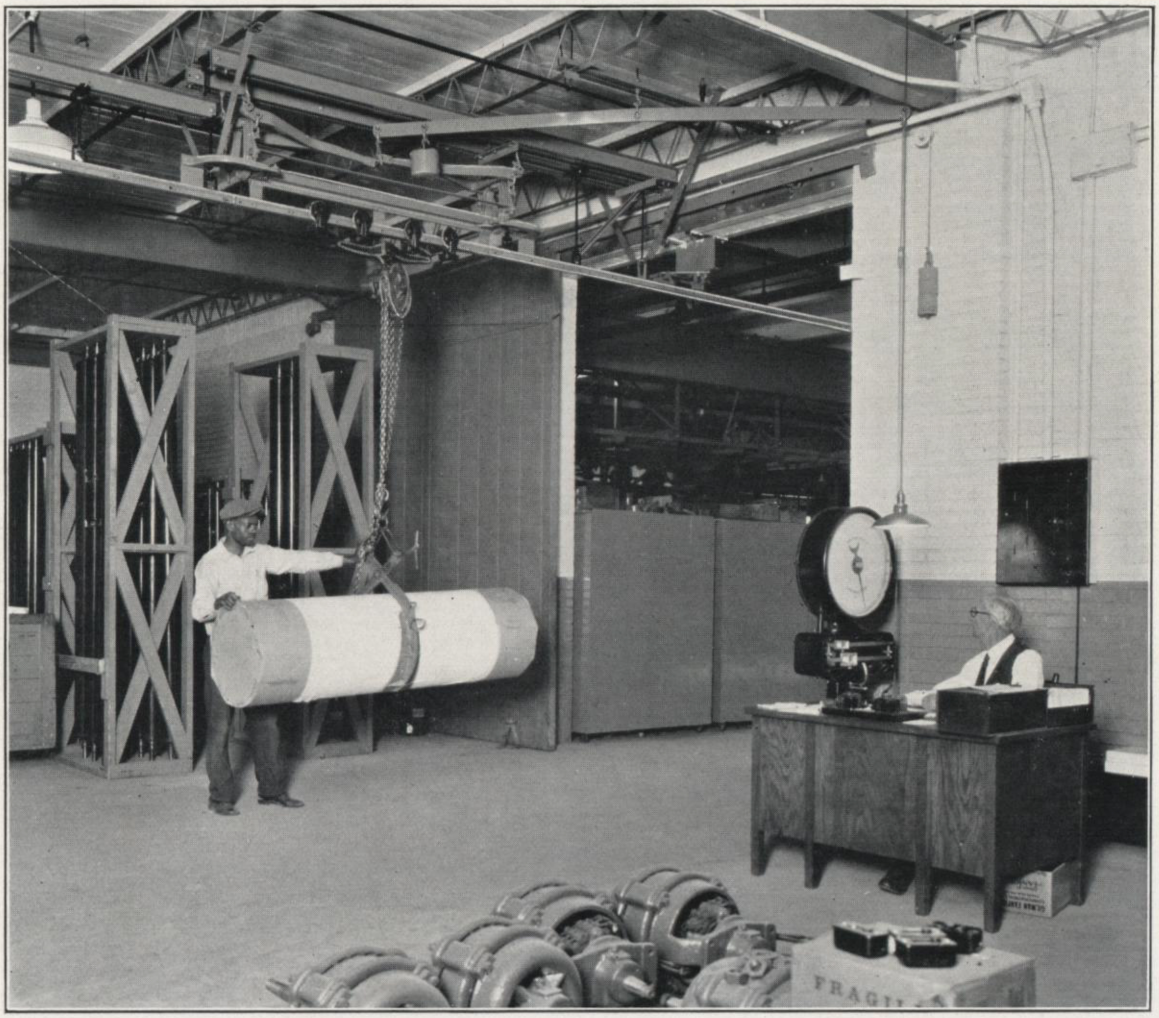


Fig. 126 *Scale in MonoRail System in plant of the Gilman Fan-Fold Corp., Niagara Falls, N. Y. Rolls of paper are weighed in transit from stock room to presses.*

Scales

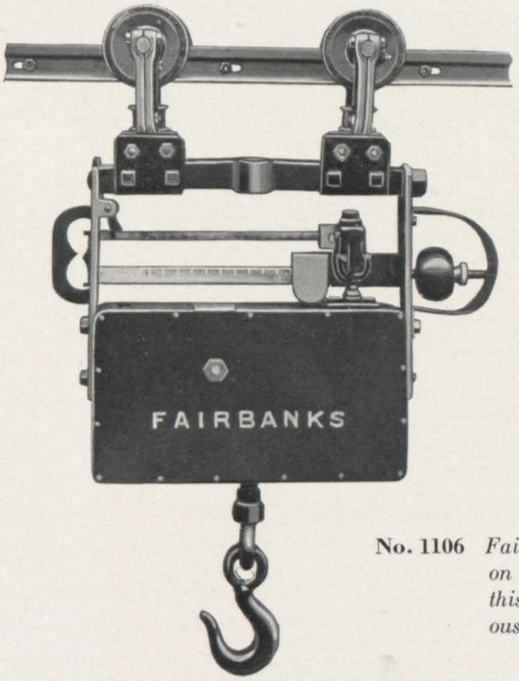
Among the many possibilities of saving in time and labor by the use of American MonoRail is that of weighing materials in transit. This is done simply and easily by the insertion of a scale section in the MonoRail runway.

The expense of such an installation is much less than that of a floor scale especially where an excavation must be made to accommodate a platform and supporting mechanism.

Nearly every standard make of scale is adapted to use with American MonoRail. On the following pages are illustrations of typical adaptations.

The weight of load may be read direct by setting the tare beam, or adjusting the dial setting for the weight of the trolley and container. Dials or beams for counting or batching can also be furnished.

Correspondence is invited on this subject. We shall be glad to work out a plan for weighing your raw materials or finished products as they pass over MonoRail track. As every installation represents new problems for study we will give personal attention to your handling situation.



Portable Scale

Scales of the portable type, mounted on MonoRail trolleys find application for weighing at various points in a MonoRail System—at receiving platforms for weighing incoming materials; for weighing batches as different ingredients are added to the batch; for weighing products in process; for weighing packages in shipping rooms.

No. 1106 *Fairbanks portable scales mounted on MonoRail trolleys. Scales of this type may be furnished in various capacities.*

Fig. 127 *Standard suspension type MonoRail scale parts, giving details of supports, checks, clearances and safety features. (Below)*

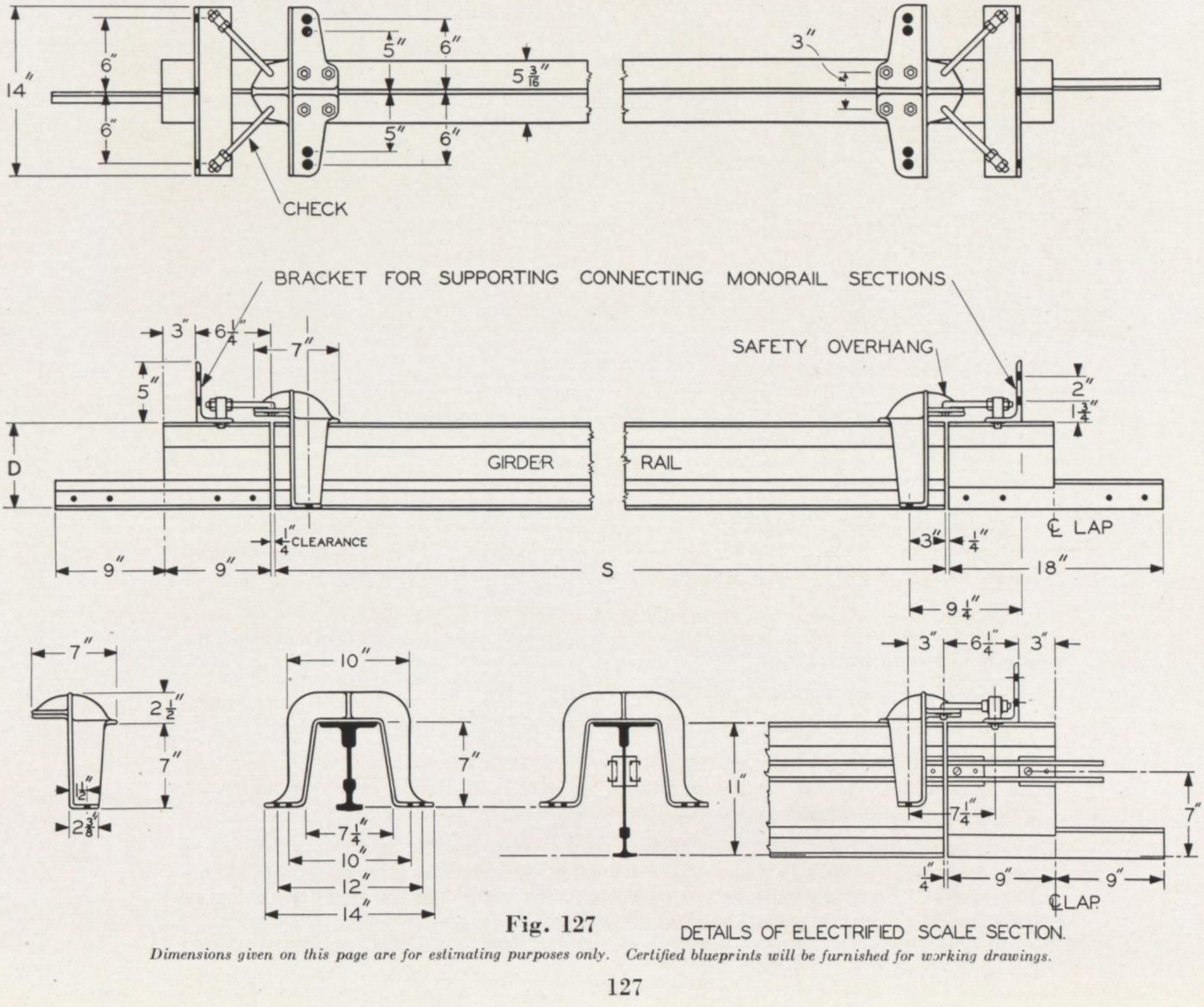
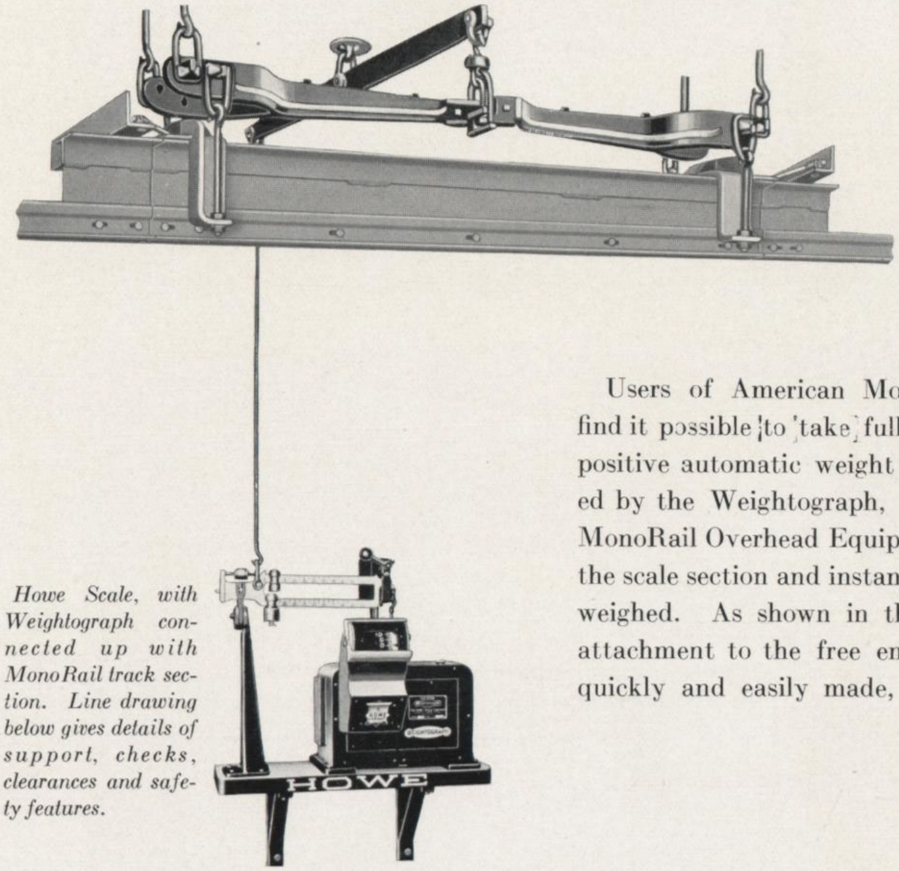


Fig. 127 DETAILS OF ELECTRIFIED SCALE SECTION.

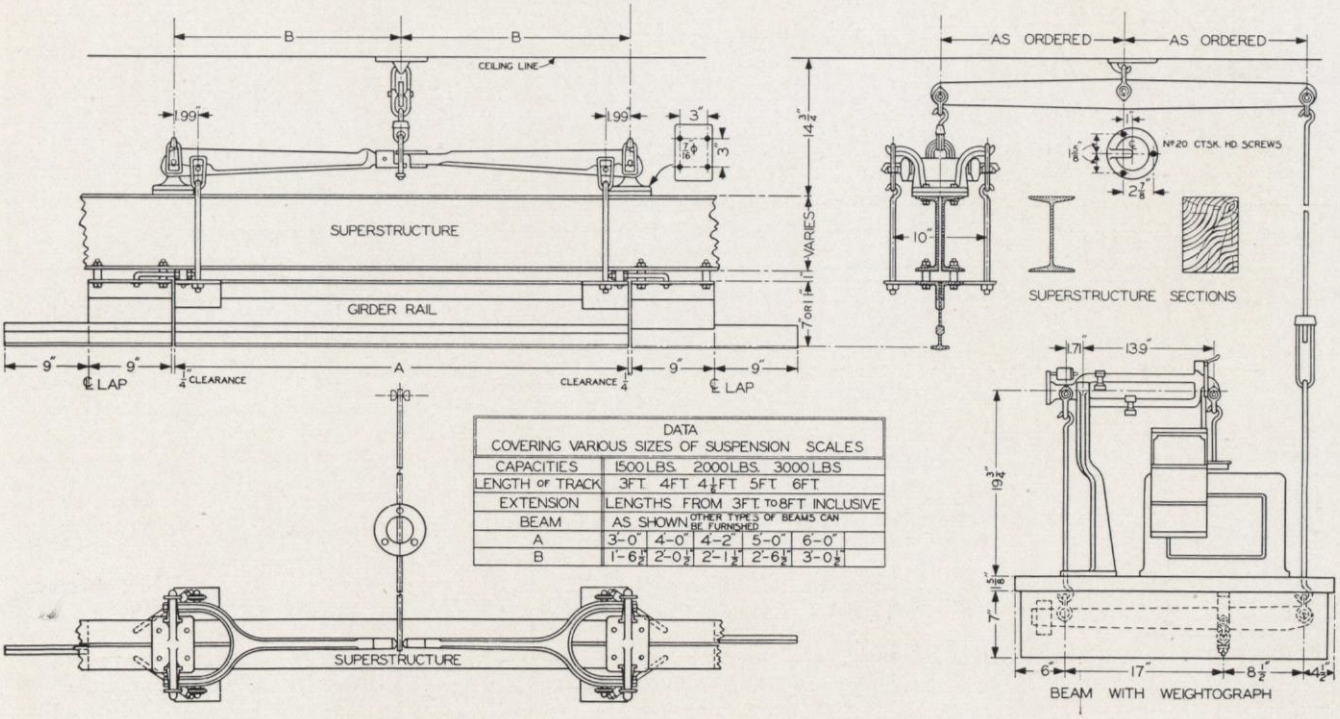
Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Howe MonoRail Scale



No. 1107 *Howe Scale, with Weightograph connected up with MonoRail track section. Line drawing below gives details of support, checks, clearances and safety features.*

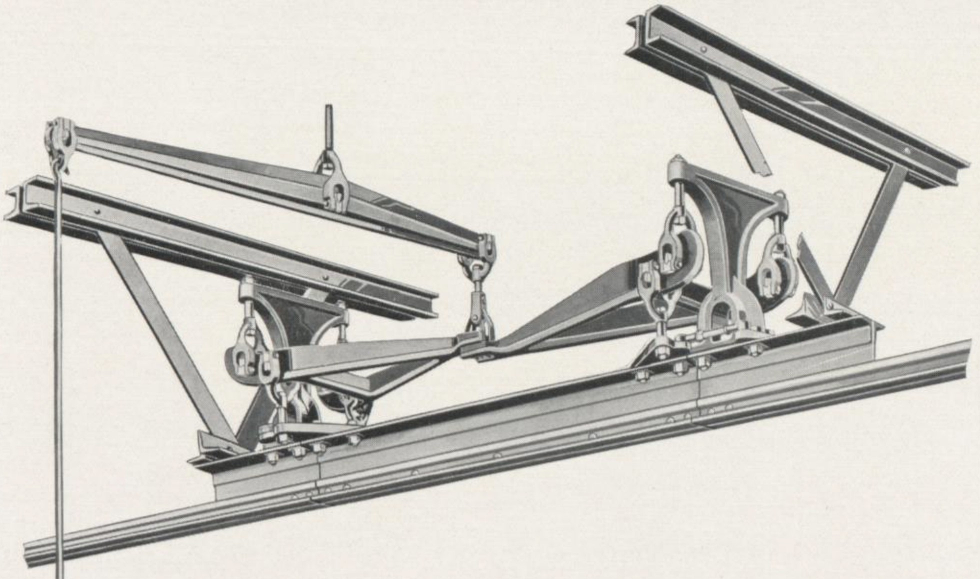
Users of American MonoRail equipment find it possible to take full advantage of the positive automatic weight indication provided by the Weightograph, Loads carried on MonoRail Overhead Equipment are run onto the scale section and instantly and accurately weighed. As shown in the illustration the attachment to the free end of the beam is quickly and easily made,



DATA COVERING VARIOUS SIZES OF SUSPENSION SCALES						
CAPACITIES	1500 LBS. 2000 LBS. 3000 LBS					
LENGTH OF TRACK	3FT. 4FT 4 1/2 FT 5FT 6FT					
EXTENSION	LENGTHS FROM 3FT. TO 8FT INCLUSIVE					
BEAM	AS SHOWN OTHER TYPES OF BEAMS CAN BE FURNISHED					
A	3'-0"	4'-0"	4'-2"	5'-0"	6'-0"	
B	1'-6 1/2"	2'-0 1/2"	2'-1 1/2"	2'-6 1/2"	3'-0 1/2"	

Fig. 128

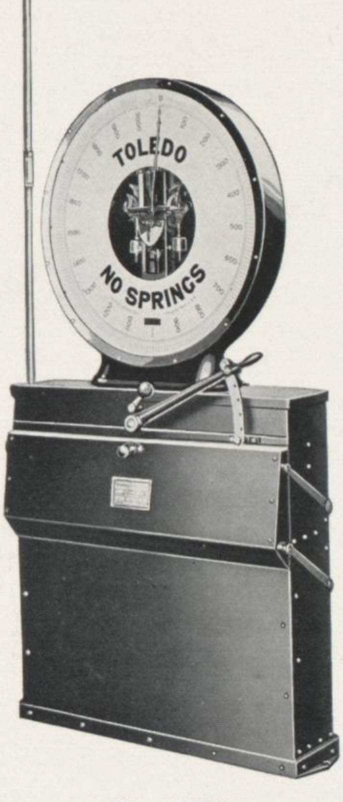
Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



No. 1108 Toledo MonoRail Scale

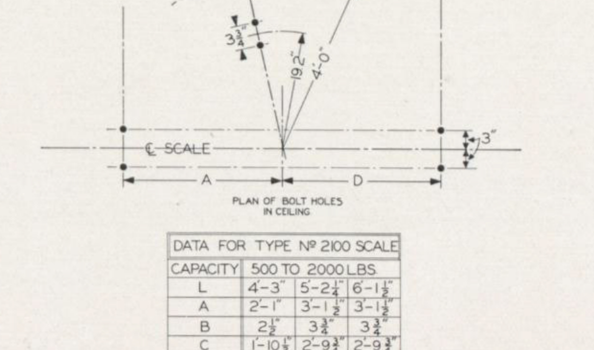
Any materials that may be handled over a MonoRail Overhead System may be weighed in transit. For this purpose the Toledo Dial Scale may be installed by a simple connection to a MonoRail track scale section through a standard system of beams and levers.

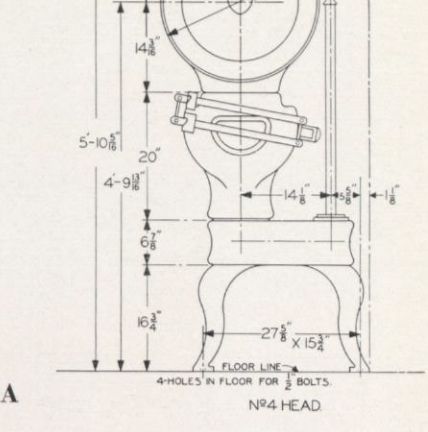
Below—*detail drawing of this application of American MonoRail to weighing in transit.*



No. 1108

Above—*Toledo Dial Scale with MonoRail track section.*



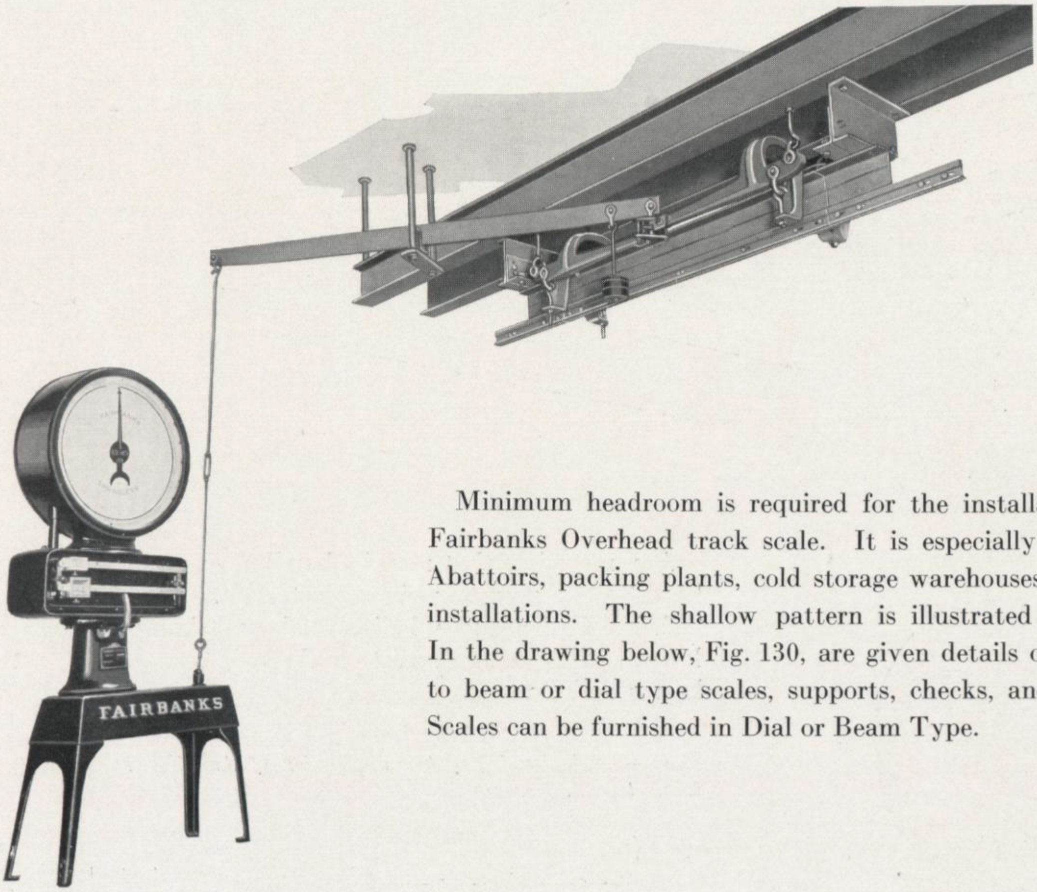


DATA FOR TYPE Nº 2100 SCALE			
CAPACITY	500 TO 2000 LBS.		
L	4'-3"	5'-2¼"	6'-1½"
A	2'-1"	3'-1½"	3'-1½"
B	2½"	3¾"	3¾"
C	1'-10½"	2'-9¾"	2'-9¾"
D	2'-1"	2'-1"	3'-1½"
E	1'-10½"	1'-10½"	2'-9¾"
F	2½"	2½"	3¾"

Fig. 129A

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

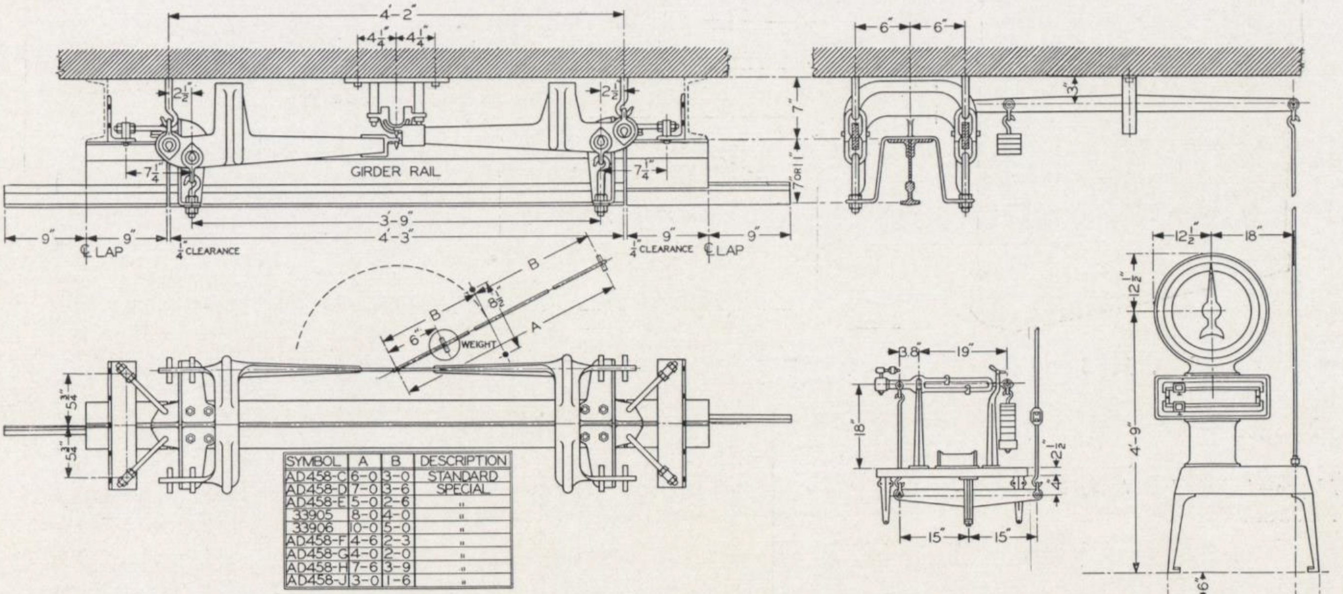
No. 1109 Fairbanks MonoRail Scale



Minimum headroom is required for the installation of this Fairbanks Overhead track scale. It is especially adapted for Abattoirs, packing plants, cold storage warehouses and similar installations. The shallow pattern is illustrated on the left. In the drawing below, Fig. 130, are given details of connection to beam or dial type scales, supports, checks, and clearances. Scales can be furnished in Dial or Beam Type.

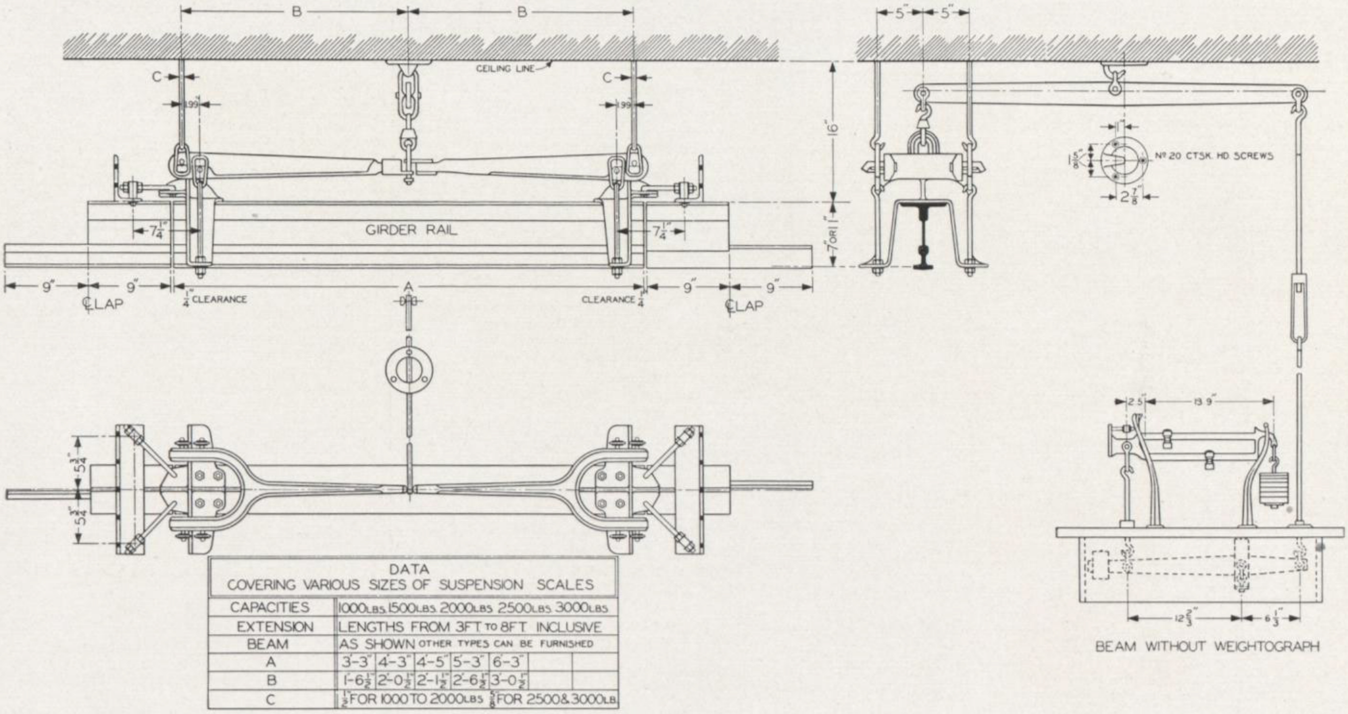
Fairbanks Dial Scale with scale section in MonoRail track.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.



SYMBOL	A	B	DESCRIPTION
AD458-C	6-0	3-0	STANDARD
AD458-D	7-0	3-6	SPECIAL
AD458-E	5-0	2-6	"
33905	8-0	4-0	"
33906	10-0	5-0	"
AD458-F	4-6	2-3	"
AD458-G	4-0	2-0	"
AD458-H	7-6	3-9	"
AD458-J	3-0	1-6	"

Fig. 130

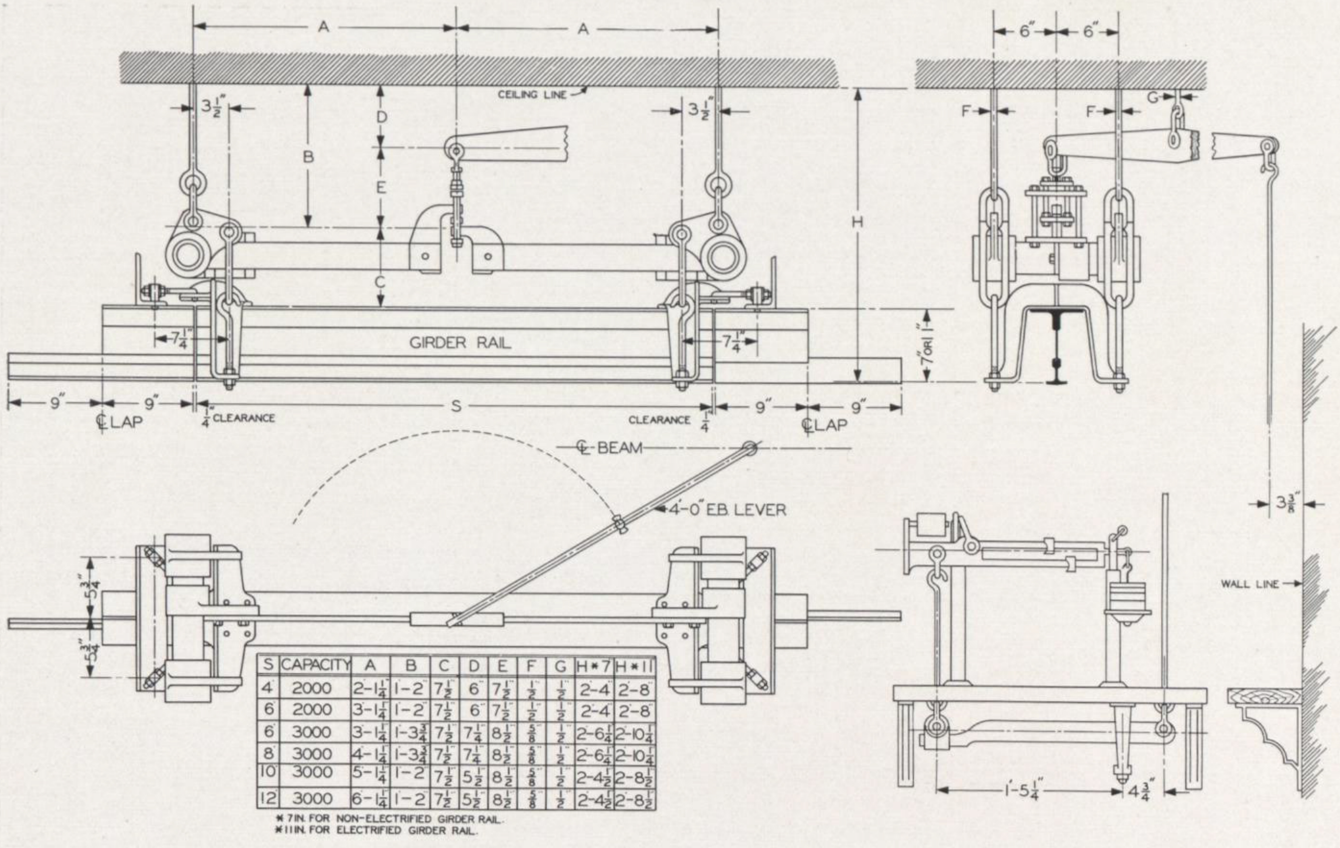


DATA
COVERING VARIOUS SIZES OF SUSPENSION SCALES

CAPACITIES	1000 LBS. 1500 LBS. 2000 LBS. 2500 LBS. 3000 LBS.						
EXTENSION	LENGTHS FROM 3FT TO 8FT INCLUSIVE						
BEAM	AS SHOWN OTHER TYPES CAN BE FURNISHED						
A	3'-3"	4'-3"	4'-5"	5'-3"	6'-3"		
B	1'-6½"	2'-0½"	2'-1½"	2'-6½"	3'-0½"		
C	½" FOR 1000 TO 2000 LBS. ⅝" FOR 2500 & 3000 LB.						

Fig. 131A

Above—*Detail of* **Howe** *Beam scale as applied to MonoRail track weighing.*
Below—*Application of* **Buffalo** *scale to MonoRail overhead conveying system where material in transit is to be weighed.*



S	CAPACITY	A	B	C	D	E	F	G	H*7	H*11
4'	2000	2'-1¼"	1'-2"	7½"	6"	7½"	½"	½"	2'-4"	2'-8"
6'	2000	3'-1¼"	1'-2"	7½"	6"	7½"	½"	½"	2'-4"	2'-8"
6'	3000	3'-1¼"	1'-3¾"	7½"	7¼"	8½"	⅝"	½"	2'-6¼"	2'-10¼"
8'	3000	4'-1¼"	1'-3¾"	7½"	7¼"	8½"	⅝"	½"	2'-6¼"	2'-10¼"
10'	3000	5'-1¼"	1'-2"	7½"	5½"	8½"	⅝"	½"	2'-4½"	2'-8½"
12'	3000	6'-1¼"	1'-2"	7½"	5½"	8½"	⅝"	½"	2'-4½"	2'-8½"

* 7 IN. FOR NON-ELECTRIFIED GIRDER RAIL.
* 11 IN. FOR ELECTRIFIED GIRDER RAIL.

Fig. 131B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Fig. 132A *Racks especially designed for handling product of Locke Insulator Corp., Baltimore, Md. Racks are mounted on swivel which permits turning to load either side without operator leaving her position at machine.*

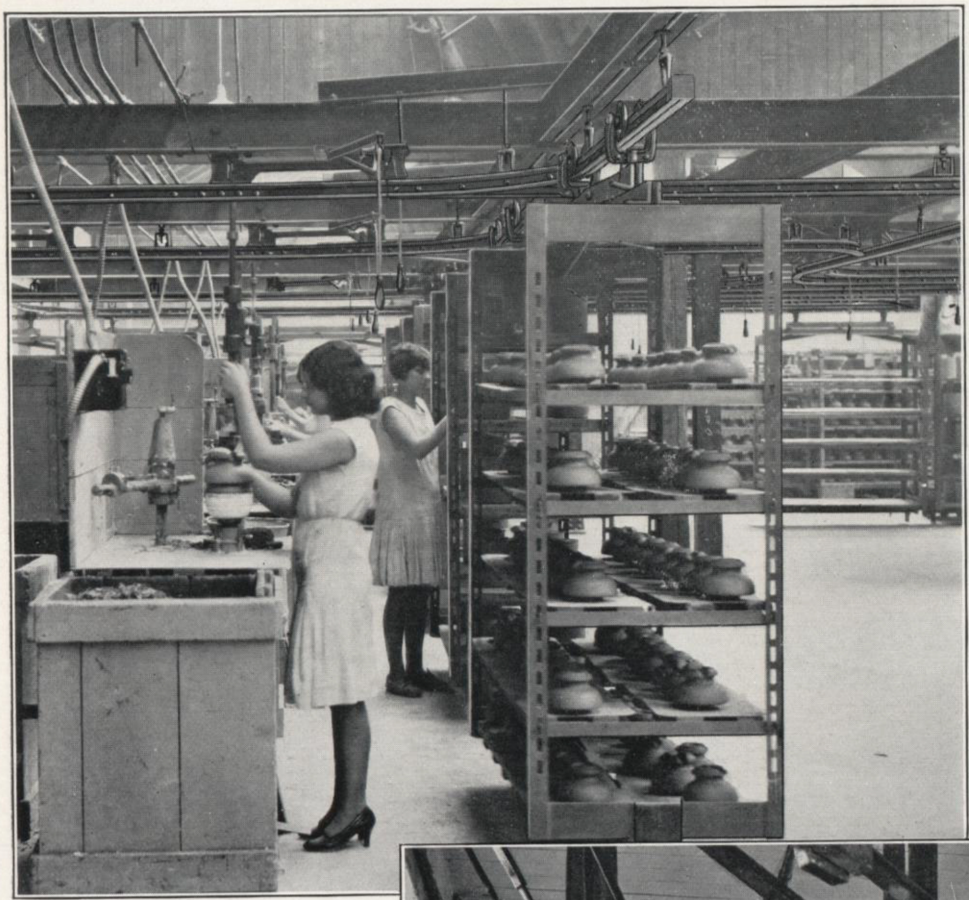


Fig. 132A

Fig. 132B

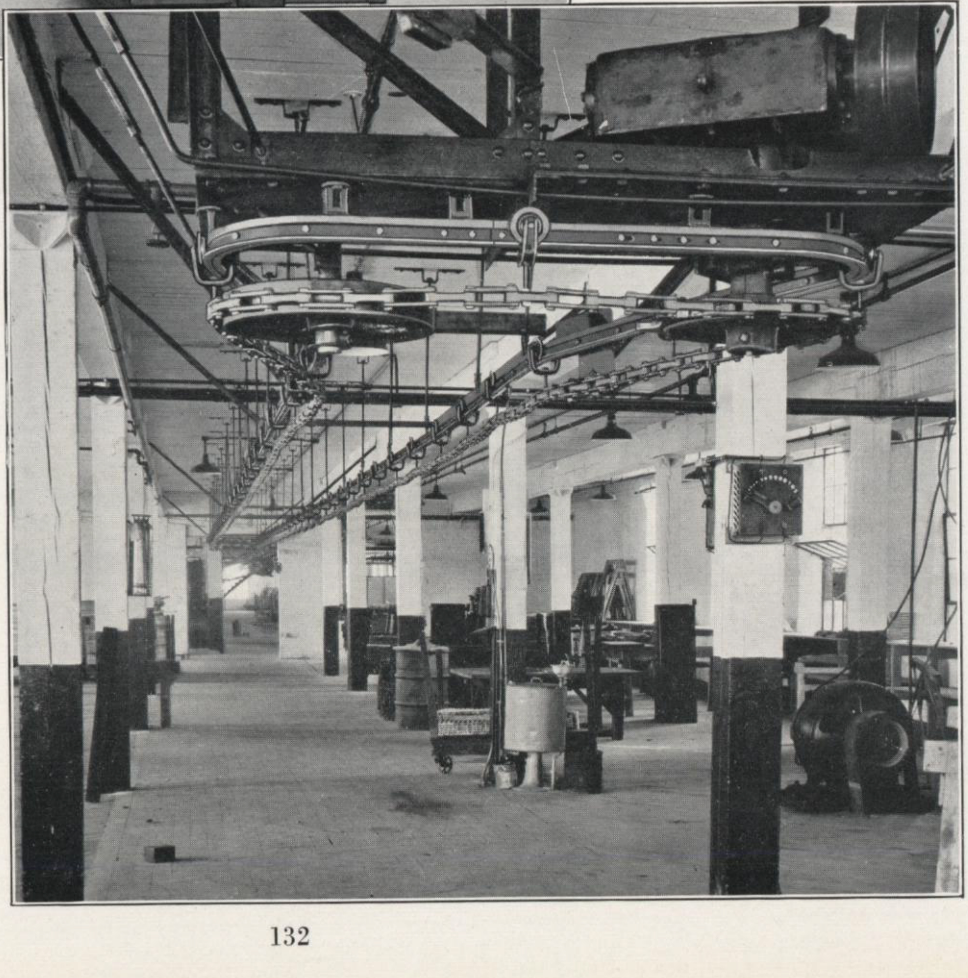


Fig. 132B *Drive end of MonoRail chain conveyor installed in the plant of Servel, Inc., Evansville, Ind., to handle refrigerator units through testing and assembly operations.*

Special Equipment By MonoRail

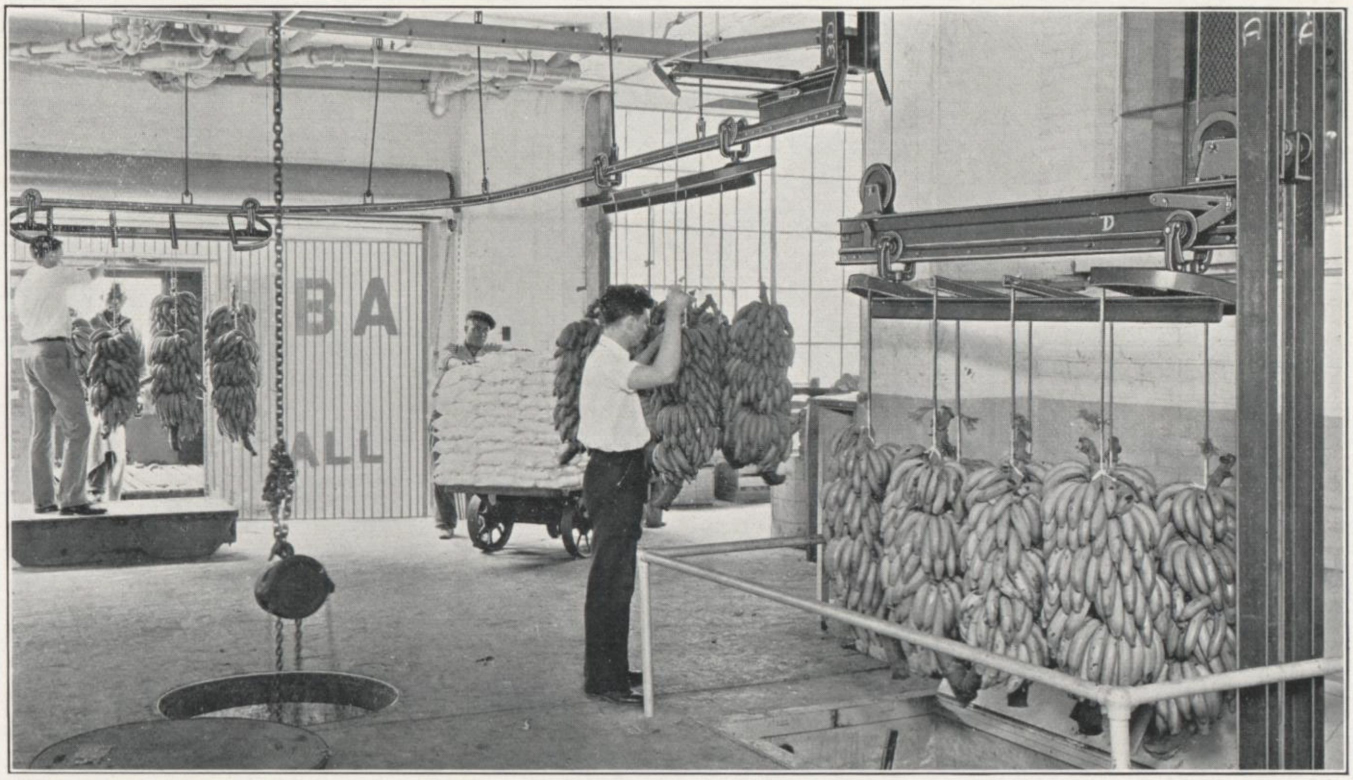


Fig. 133A

Every installation of American MonoRail differs in some important respect from every other. No two material handling situations are identical, even in the same industry where major conditions are the same.

The variations in requirement come most frequently in the adaptation of American MonoRail to the handling of the specific article or articles of manufacture.

These vary from special equipment for handling pig iron, molten metal and finished castings in the foundry, to delicate glass or porcelain ware in ceramics plants, with a wide range in between of such products as paper, textiles, food stuffs, clothing, airplanes, power boats, toy balloons, in scores of different industries.

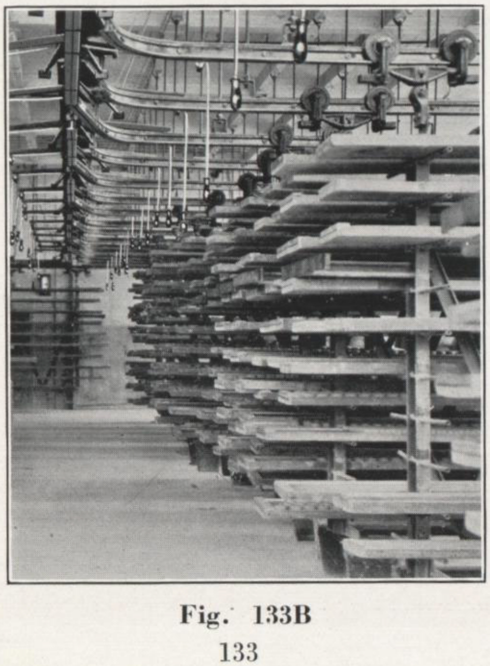


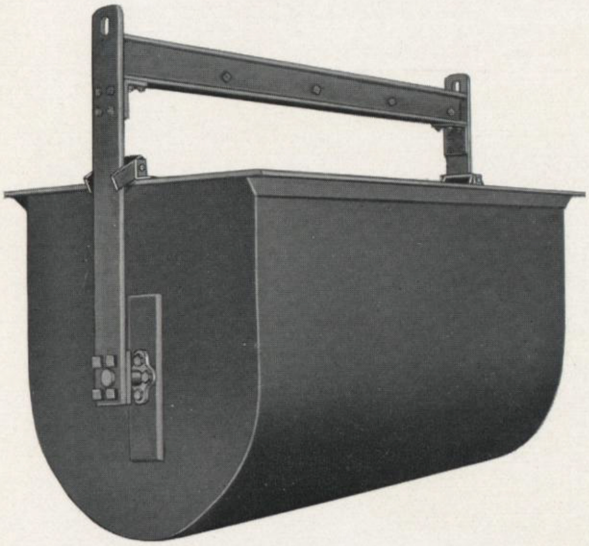
Fig. 133B

MonoRail engineers are called upon almost daily to develop special carriers for materials, raw, in process, or finished—the "different" products of some industrial plant. Years of experience in this field have given them a background which ensures the owner of a MonoRail system the most efficient material handling equipment it is possible to install.

On this and succeeding pages of this book will be found illustrations of some of the pieces of equipment that have been designed for special handling jobs. The banana-handling rack shown above, and the racks for carrying porcelain ware on the left, are typical of this special equipment.

No. 1430 Standard Side Dumping Tub

Size of Bucket Cu. Ft	Overall		Inside			Outside	
	Length	Height	Width	Length	Depth	Top to Hook Connec.	Side Clearance for Dumping
15	4′-0″	39″	26″	3′-7½″	26″	12″	20½″
20½	4′-0″	44½″	30″	3′-7½″	30½″	14″	24″
27½	4′-0″	49½″	36″	3′-7½″	34″	15½″	27″

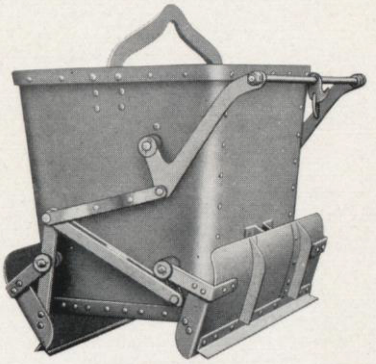


No. 1430

This standard side dumping tub is made up of 10-gauge steel sheets with ends of $\frac{3}{16}$ inch steel, reinforced with angle iron. Corners turned over and welded.

Tubs, buckets, and containers of various types, sizes and capacities can be furnished to meet any material handling situation calling for this sort of equipment. Illustrations on this and following pages show designs frequently used. All are of sturdy rugged construction, built for service and long wear.

No. 1431 Special Bottom Dump Bucket



No. 1431

This type of bucket has found general acceptance where operating conditions make a dump bottom desirable or necessary.

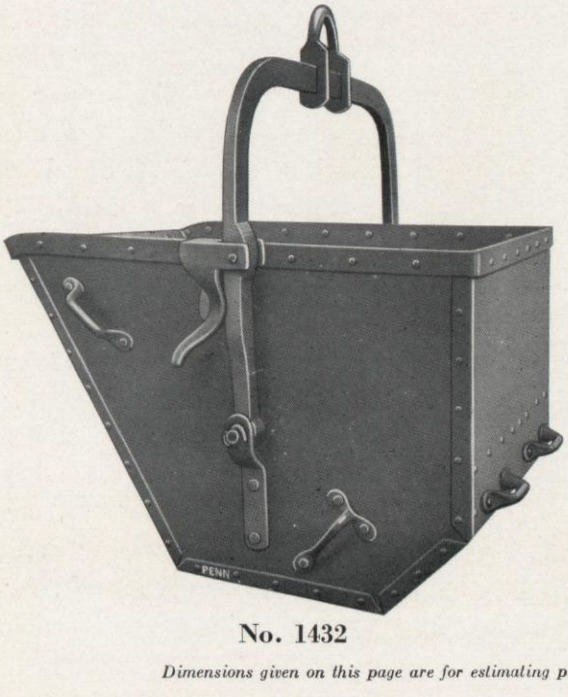
When closed, the weight of the load in bucket holds the doors in place, and when levers are thrown over center, the weight of the load completes the opening of the bucket. When the doors open, they swing wide, insuring quick and clean dumping.

Doors are heavier plate than the sides and are reinforced to guarantee long life.

Capacity in Cu. Ft.	Body Dimensions			Over All Width	Over All Height
	Length	Width	Depth		
14	32	28	32	36	44
21	38	32	38	40	52
27	42	36	40	44	54
42	48	37	48	46	62
54	52	42	52	52	68
68	54	48	52	58	68

No. 1432 Heavy Tipping Bucket

This type of bucket, in general use in foundries, machine shops and contractors' operations, is made extra strong and durable. It has an extra wearing plate inside riveted to bottom and extending half-way up front and back. Material and workmanship of this bucket are their own guarantee of satisfactory service with long life. Casters may be put on this bucket at extra charge.



No. 1432

Capacity in Cu. Ft.	Body Dimensions			Over All Width	Over All Height
	Length	Width	Height		
6	32	22	19	29	37
8	34	26	20	33	39
10	36	29	21	36	41
12	38	30½	22	38	43
14	40	31	24	39	44
16	42	33	25	41	47
18	44	33	27	41	48
21	46	35	28	44	51
27	50	38	31	48	56
36	56	40	34	50	62
42	60	42	36	54	64

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

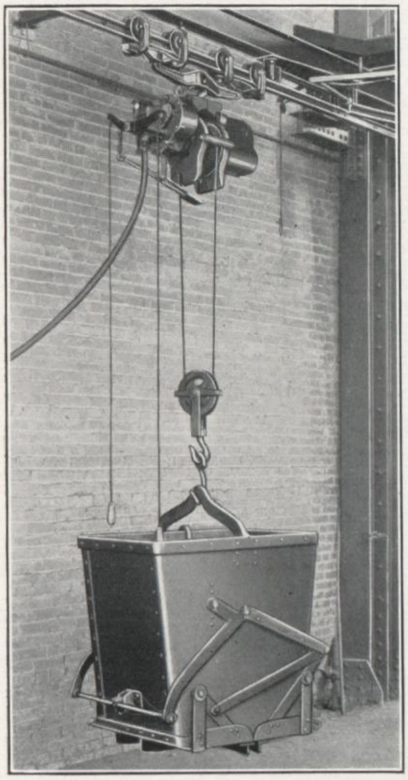
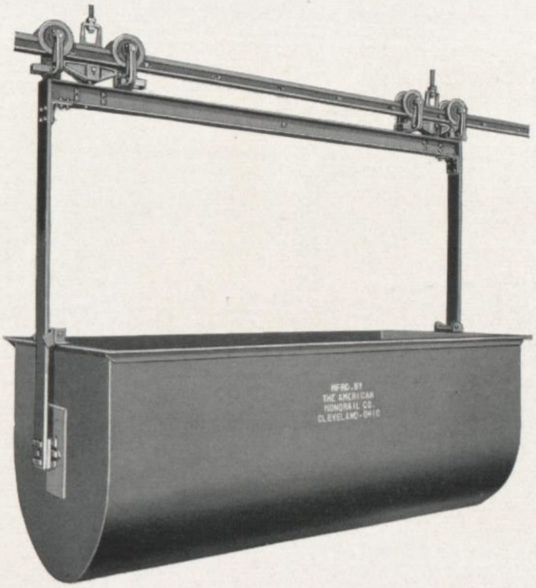


Fig. 135A *Bottom dumping bucket. Note air-motor hoist carried on MonoRail trolley.*



No. 1433 *Side dumping tub with special suspension from MonoRail trolleys.*

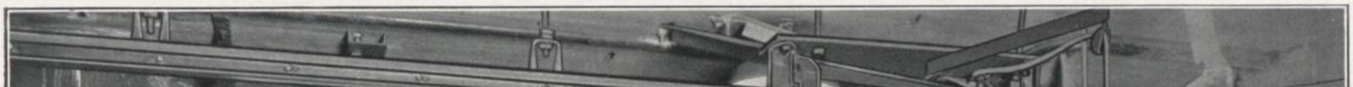
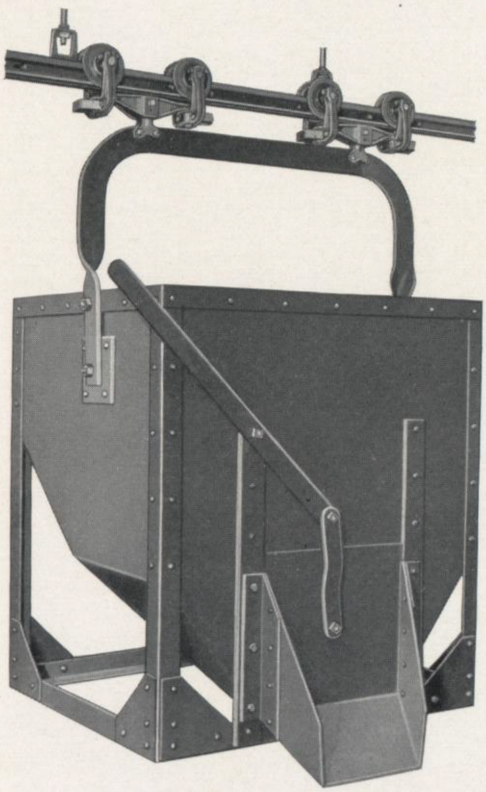


Fig. 135B *Coal and ash handling system. Ash tub in dumping position at hopper on left. Bottom dumping or hopper type coal bucket with rack and pinion control on MonoRail at right.*

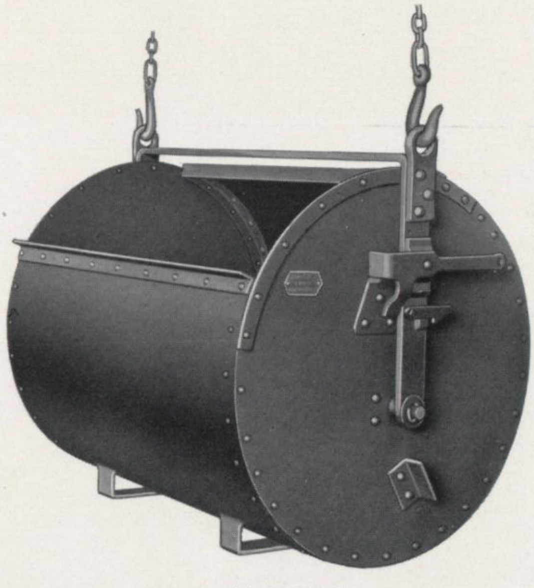
The containers shown on this page are specially built for special applications but can be furnished in various sizes, The requirements of a given situation will be studied and containers of the particular type to meet the need will be furnished,



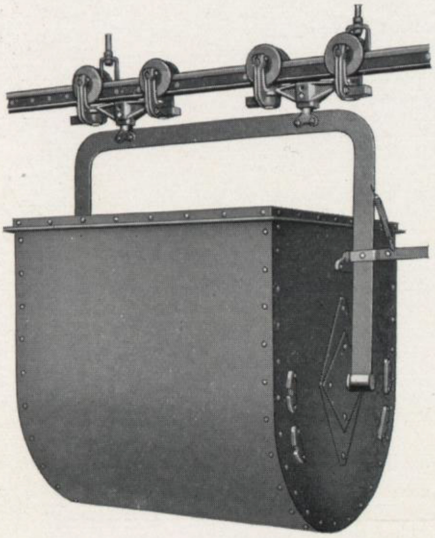
No. 1434

No. 1434 *In many applications where a container, dumping from bottom and side, is desirable, this heavy steel bucket will meet the requirements.*

No. 1435 *A headroom-saving tipping bucket. It will tip for dumping within its own radius.*

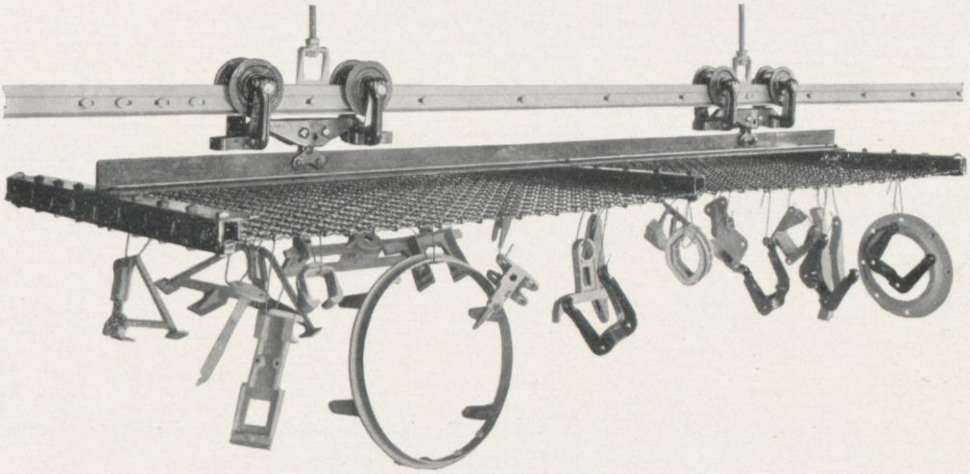


No. 1435



No. 1436

No. 1436 *A heavy duty side dumping bucket, adapted to the handling of heavy or coarse material. Stops on end plate permit holding bucket in intermediate positions. Where special plant conditions require, this bucket will be furnished in Armco or Toncan iron.*



No. 1901 *Special rack designed to handle small parts for dipping. Note that wire mesh permits spacing of articles of various sizes.*

No. 1901

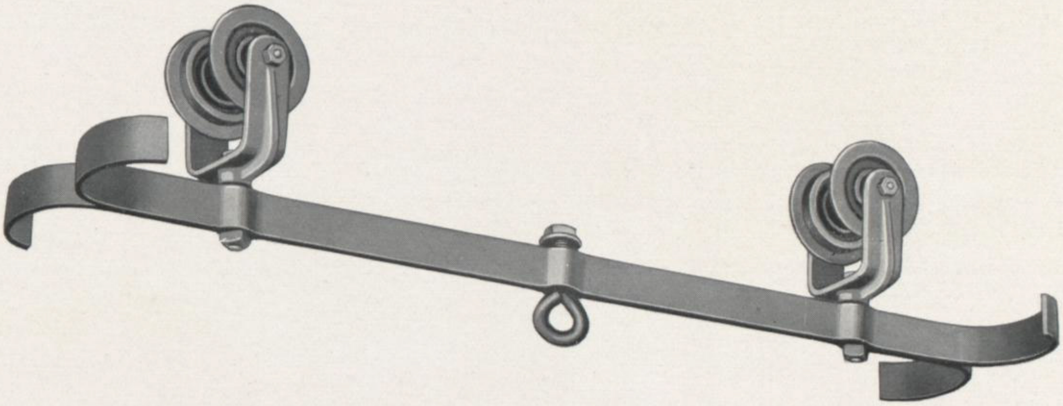
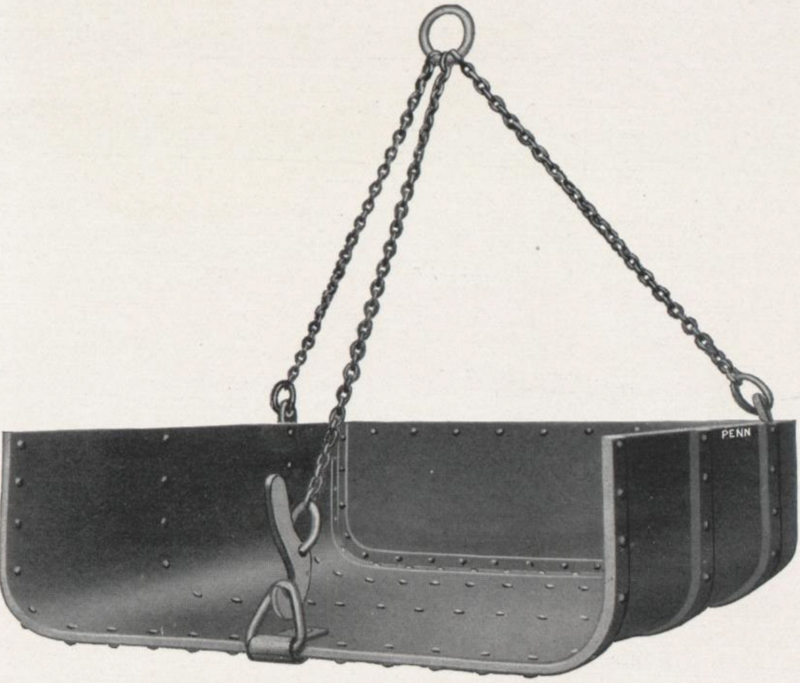


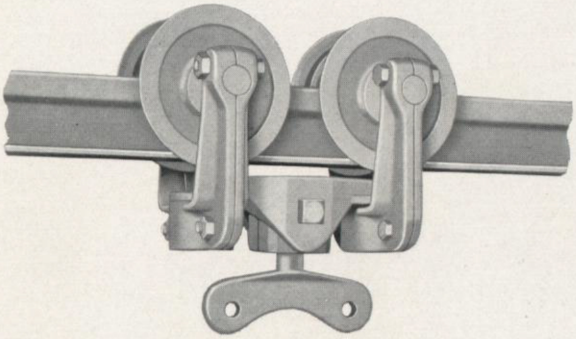
Fig. 137

No. 137 *Special trolley designed for light service where bulky load must swivel. Extended frame prevents loads from bumping together and makes possible shoving train of trolleys around short radius curves.*

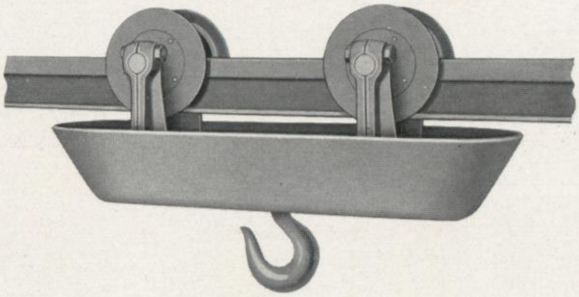


No. 1437 *A heavy skip, better adapted for some forms of handling than any other type of bucket. They are built of heavy plate with either flat iron, angle iron or channel iron reinforcing. May be had in capacities up to 30 cubic feet.*

No. 1437

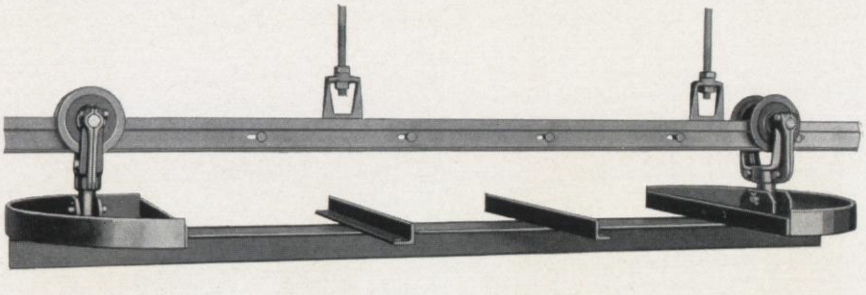


No. 142 *Close coupled American MonoRail Trolley. Designed to meet conditions where heavy loads are handled and where it is desirable to secure the closest spacing of trolleys to conserve track footage.*

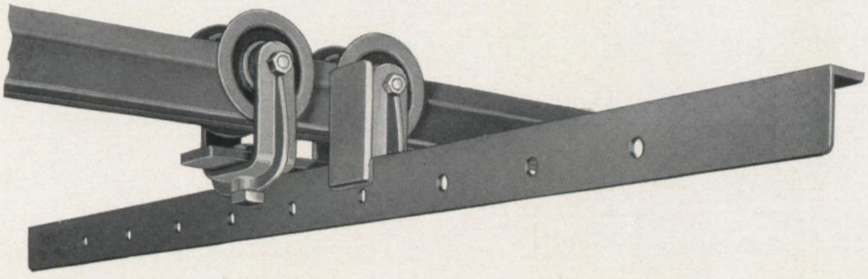


No. 133 *Special trolley built for service where dustless condition was important. Soft grease in pan captures and holds dust particles dislodged from track. Fibre wheels prevent loosening of metal particles.* (*Patented*)

The design of the parts used in the assembly of American MonoRail Trolleys is so flexible that trolleys can be furnished in various assemblies to meet the application they are called upon to cover. Combinations of trolley assembly and special racks or carrying members can be worked out for handling an almost unlimited line of products of various sizes, shapes and weights. The special trolleys shown on this and other pages are only a few of the many designs we are prepared to furnish.



No. 149 *Special trolley rack for handling bananas from car to ripening room. See page 133.*



No. 135 *Carrier built to handle small parts through a drying operation. Trolley is propelled by a chain booster system.*

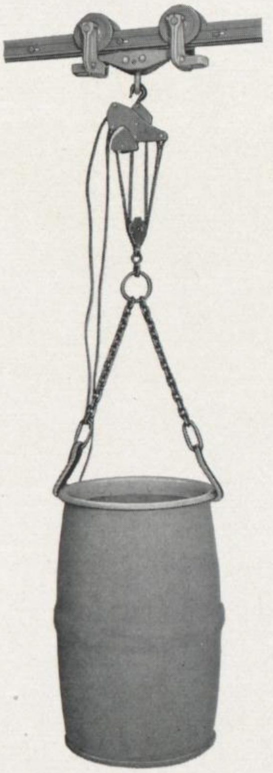
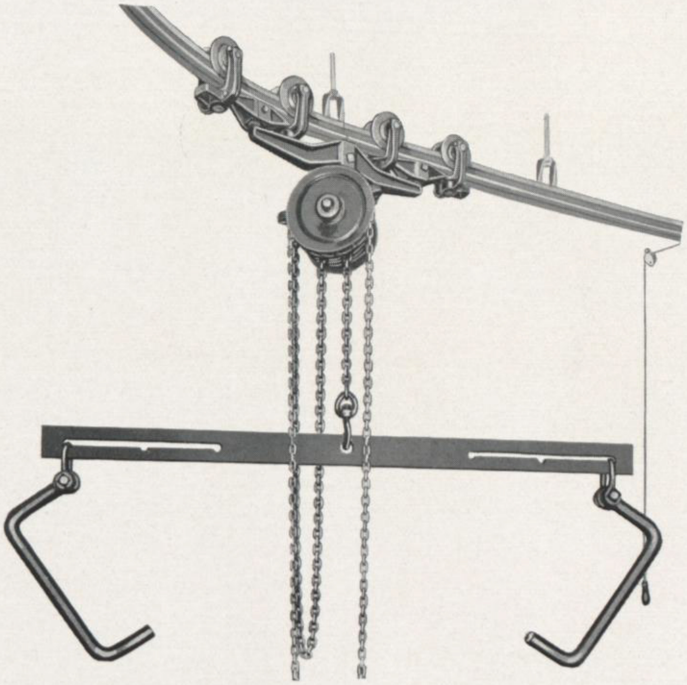
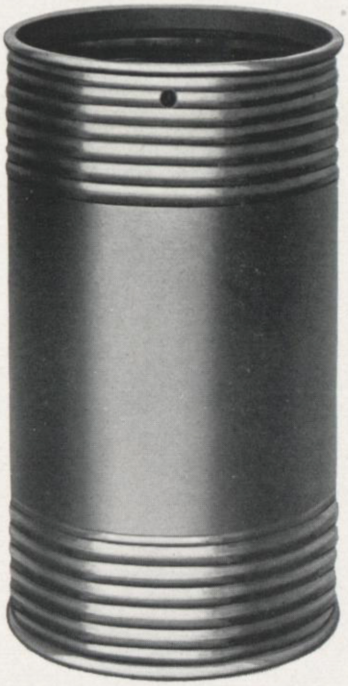


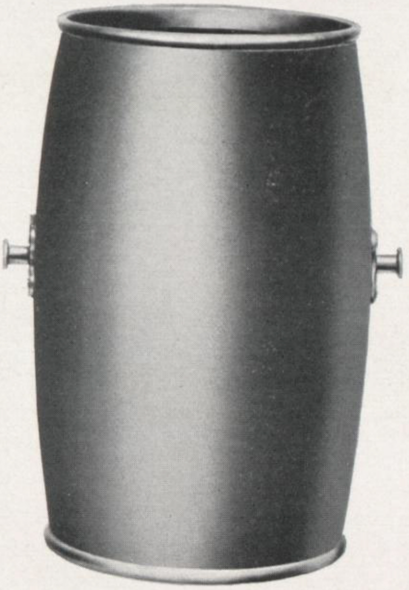
Fig. 139A *Steel shop barrel, carried by Burr Self-Locking Rope Hoist and chain sling grab. For illustration of hoist see page 115, and for chain slings, page 140.*



No. 1902 *A grab for handling paper in rolls. Note provision for adjustment to rolls of various lengths.*



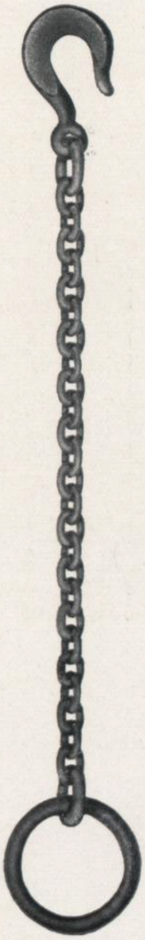
No. 1438



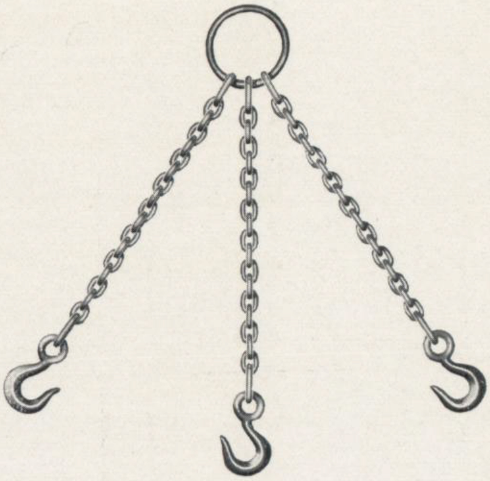
No. 1439

No. 1438 and 1439 *Steel shop barrels. With MonoRail overhead equipment they solve the problem of handling many small parts. Easily handled by proper grab and hoist.*

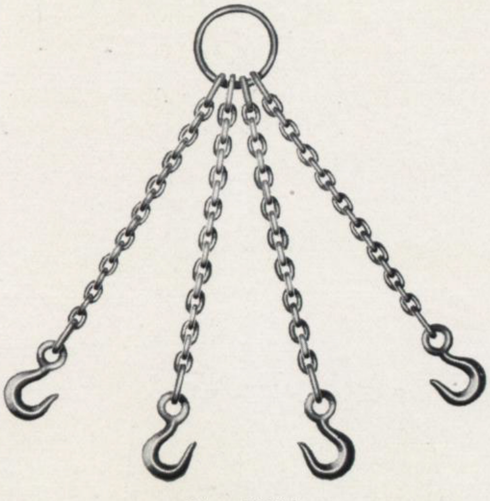
Chain Slings And Grabs



No. 1903



No. 1904



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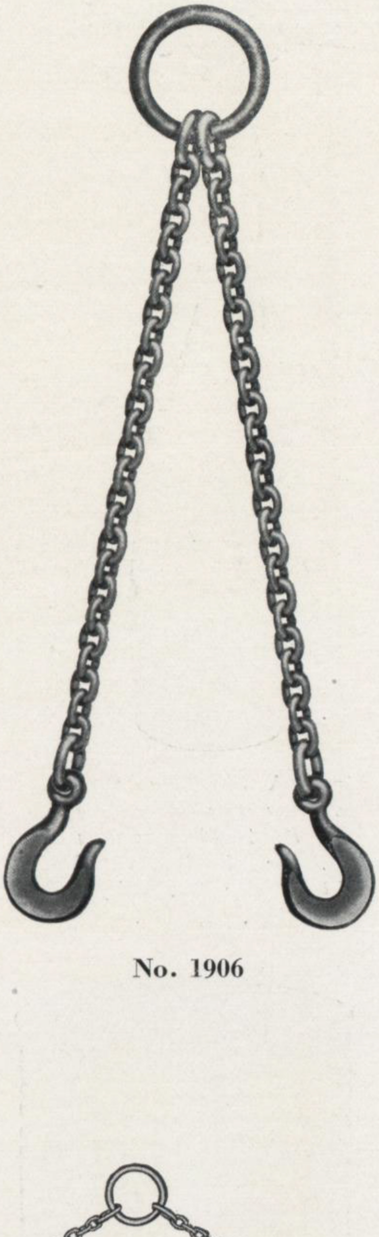

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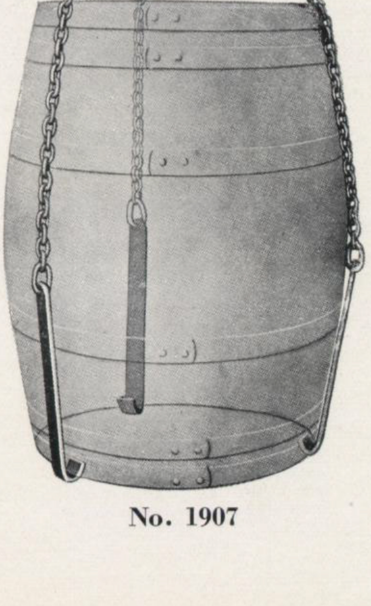
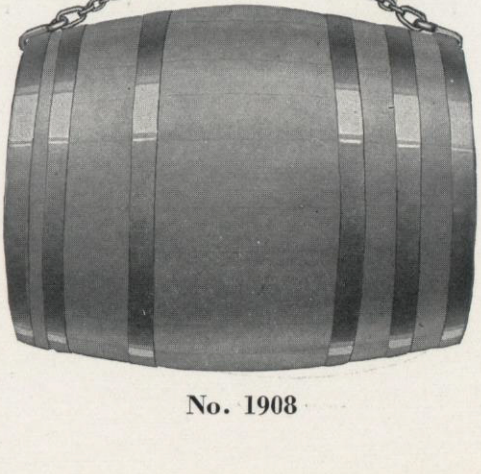
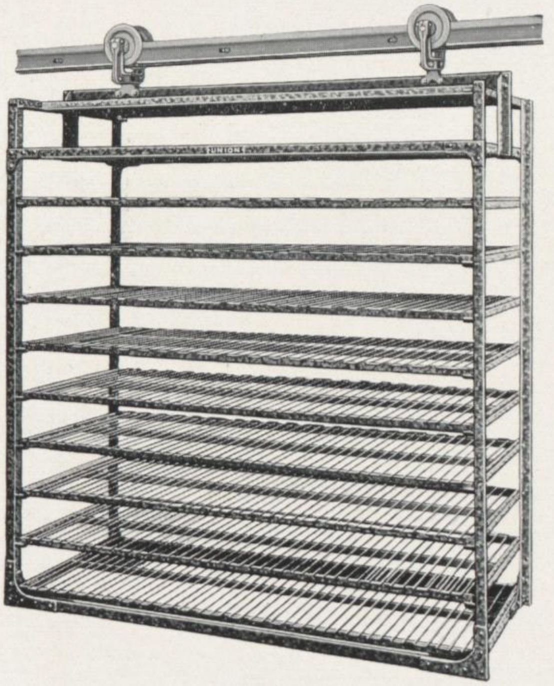


No. 1907

An almost unlimited number of "picking up" and handling jobs may be done by chain slings or chain grabs. On this page are illustrated a variety of combinations with illustrations of their use.

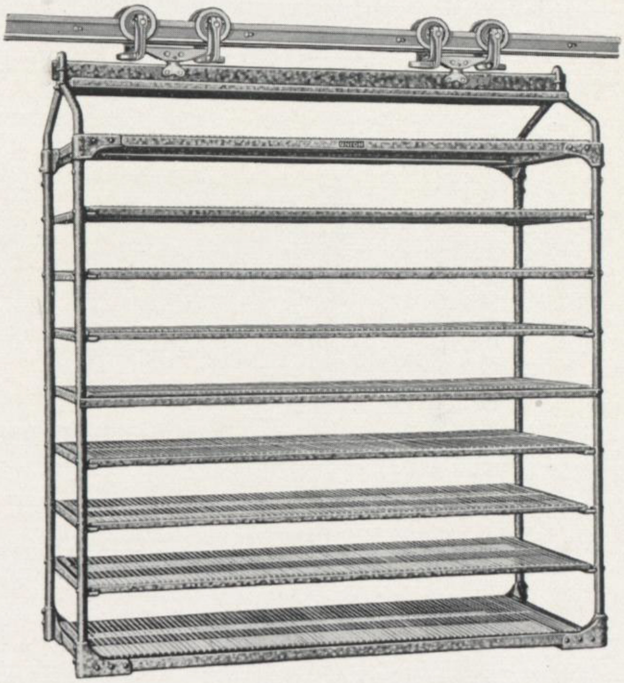


No. 1908



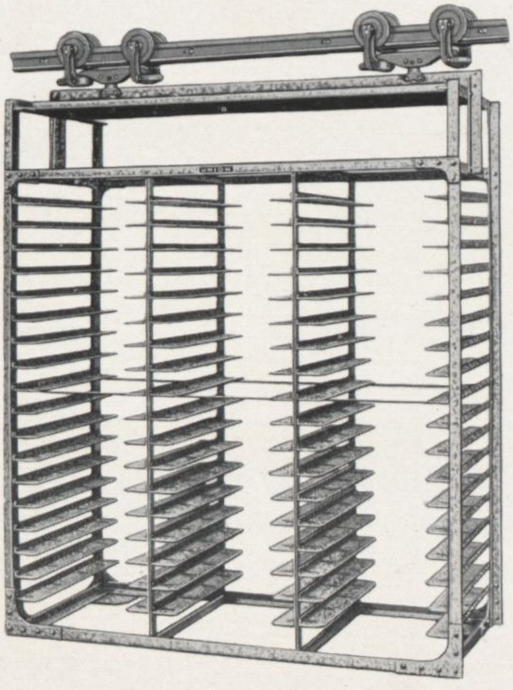
No. 1909

No. 1909 *A galvanized bakery rack supported on two two-wheel trolleys equipped with standard swivel.*



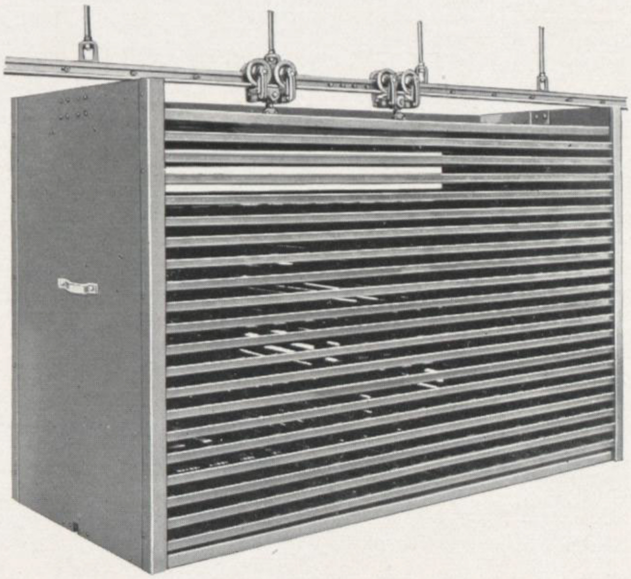
No. 1910

No. 1910 *A galvanized pan rack. Carried by two four-wheel MonoRail trolleys.*



No. 1911

No. 1911 *Galvanized bakery rack. Supported on two four-wheel trolleys with standard swivel.*



No. 1912

No. 1912 *Special rack built to handle flat sheets. The special close coupled trolley was designed to permit turning the rack on MonoRail giant turntable.*

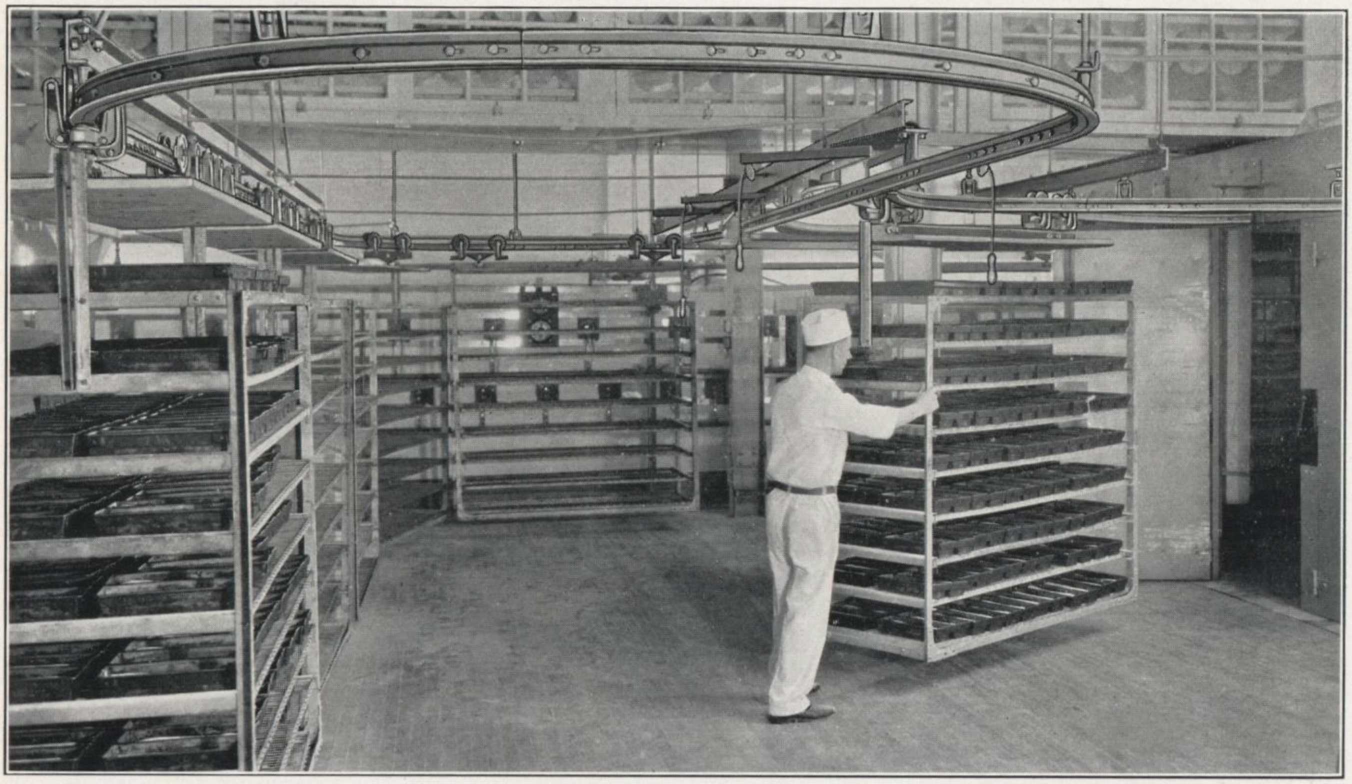


Fig. 142A *Racks used in the Bakery Division of the National Tea Company, Minneapolis.*

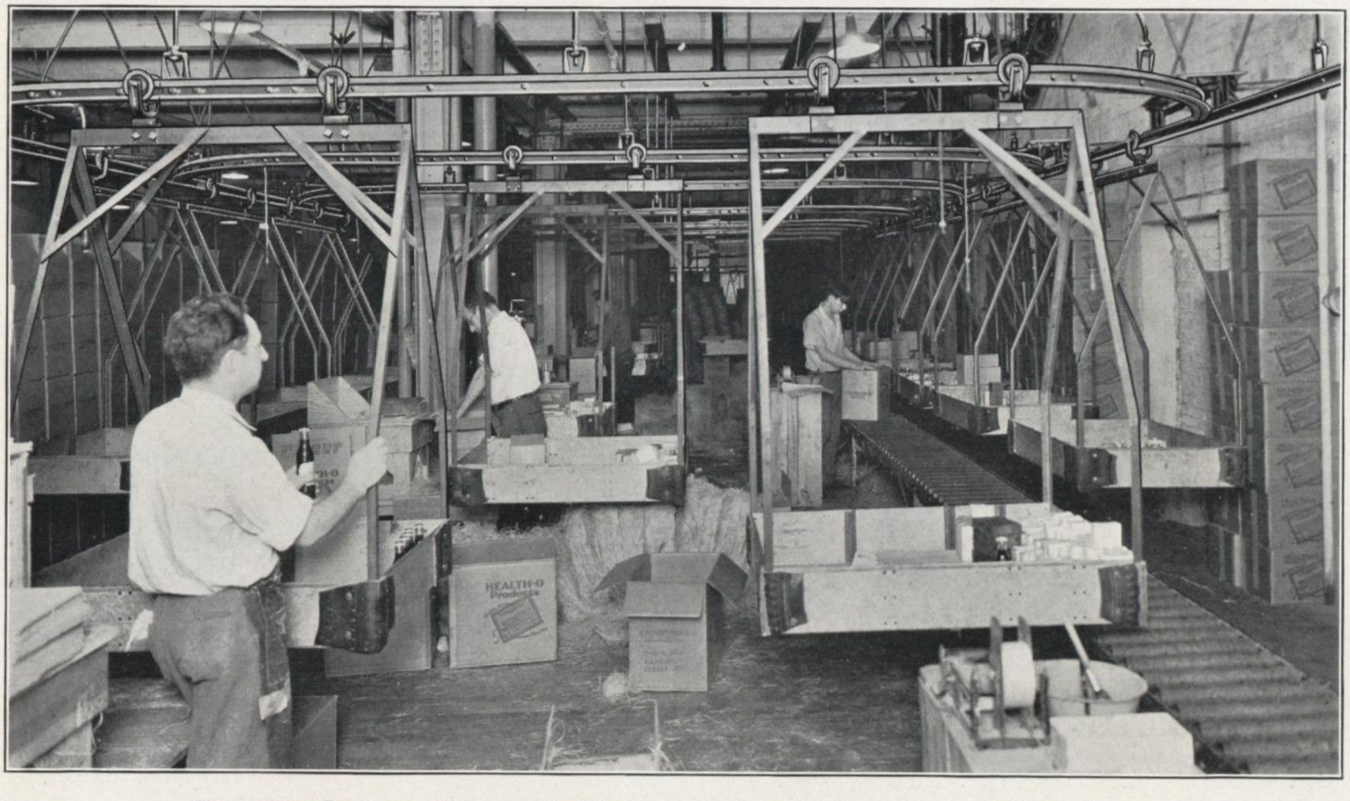
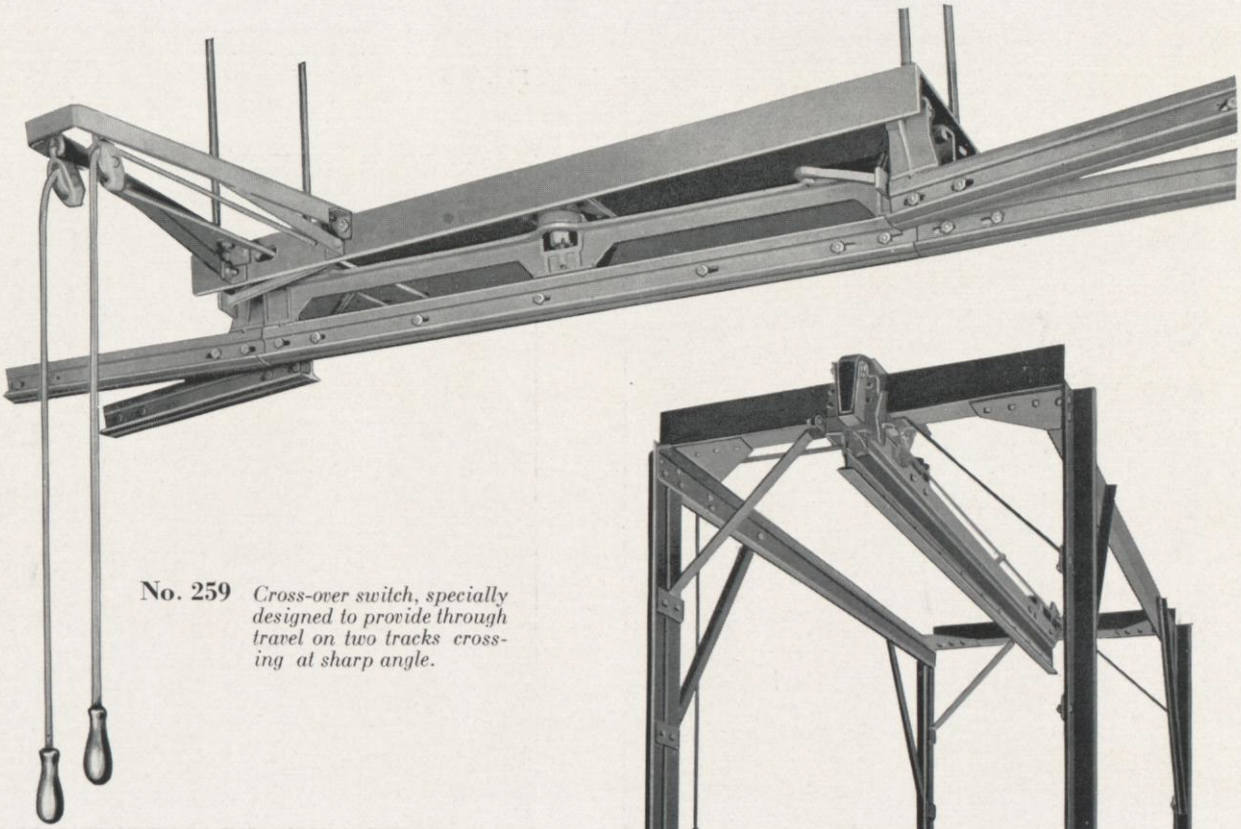


Fig. 142B *For the assembling and handling of mail orders, the Milson Company, Cincinnati, uses these trays, which carry the complete order from stock room to packers' benches.*



No. 259 *Cross-over switch, specially designed to provide through travel on two tracks crossing at sharp angle.*

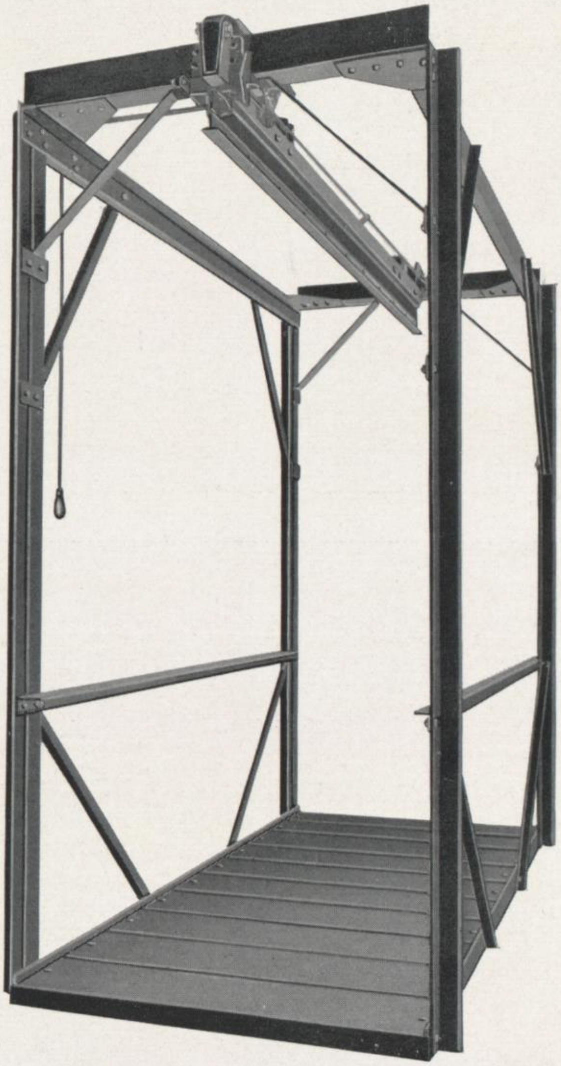


Fig. 143B

Fig. 143B *Special car for lift in glass plant. For lifting plate glass from floor to floor. Not a passenger elevator—floor of car being used only as a guard to close opening in floor of building.*

Fig. 143C *Trolley built for applications which call for frequent turning of the rack supported by the center swivel. This swivel is a two-part forging equipped for Alemite lubrication, sealed with a fibre gasket. Ends of bars are formed to guide ends of rack and have a hole for latching rack in position parallel to the track.*

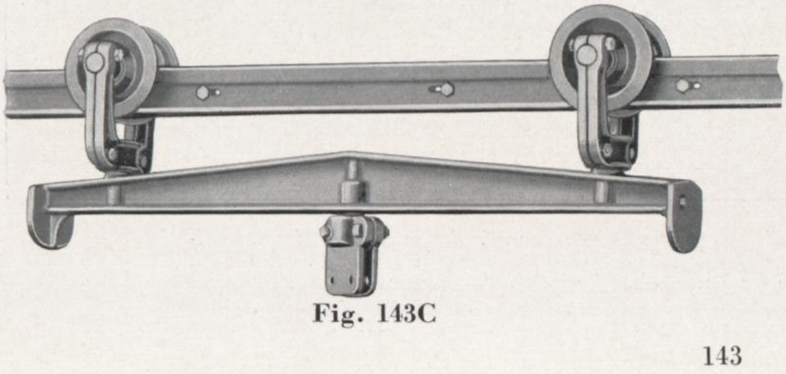


Fig. 143C

Fig. 144A *Special batch tub with built-in scale, carried on special MonoRail transfer section. Ingredients are weighed into tub which dumps into tanks at right. The A. M. Collins Mfg. Co., Philadelphia.*

Fig. 144B *Scale built into special transfer unit. Scale carried with transfer section. Batch can be weighed at any point.*

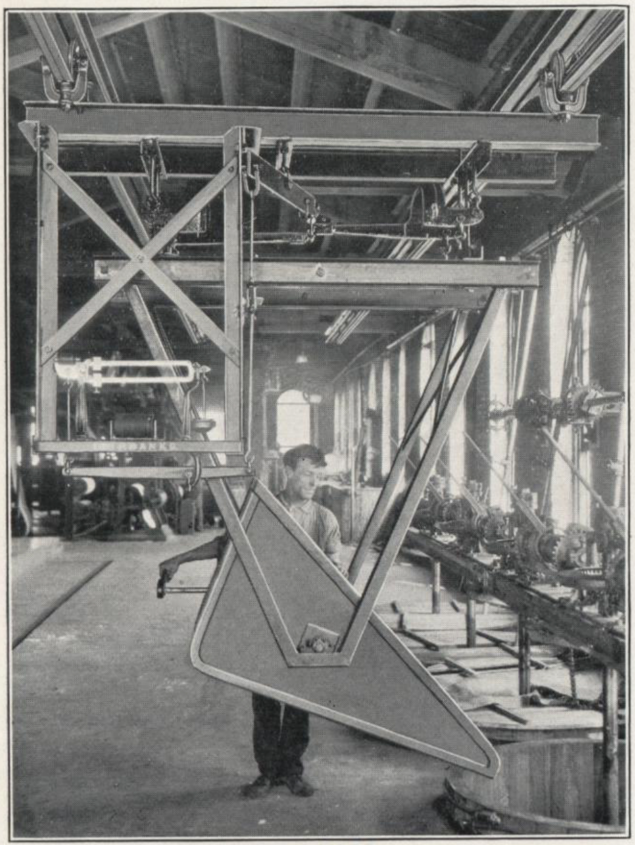


Fig. 144A

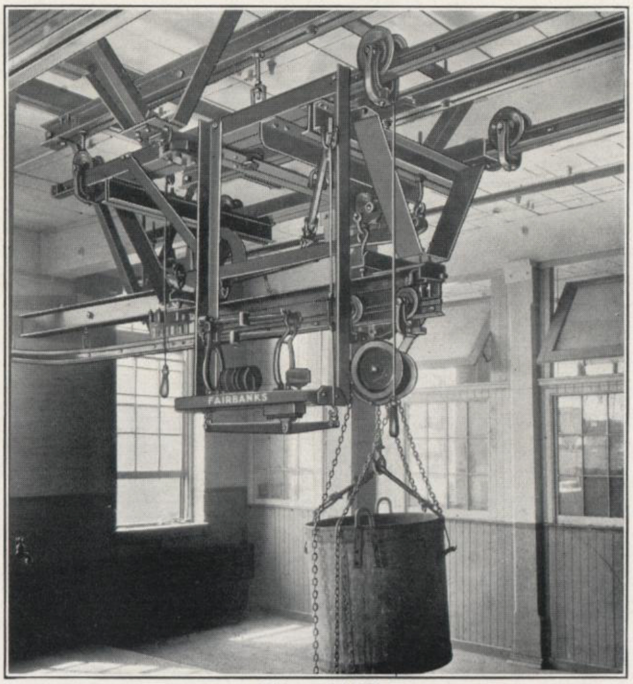


Fig. 144B

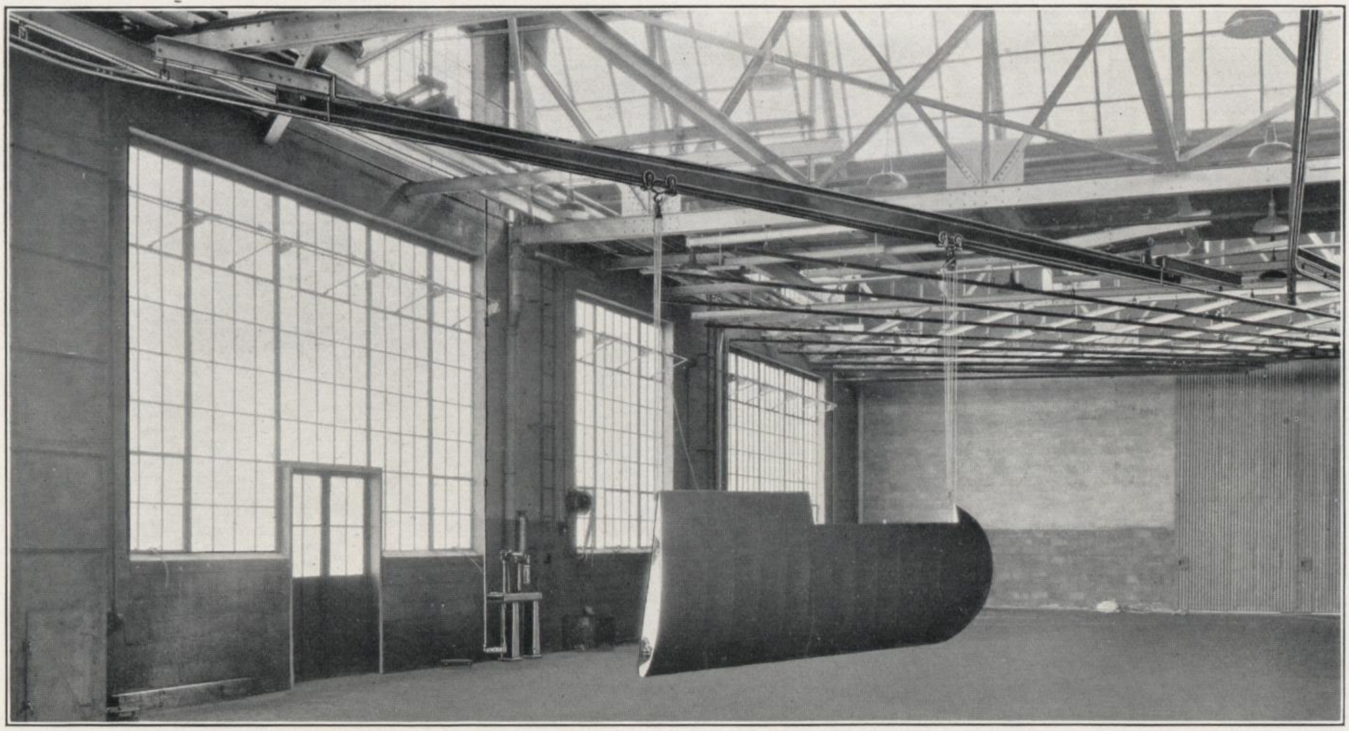


Fig. 144C *A forty-foot track-scale section in the plant of the Glenn L. Martin Aircraft Corp., Baltimore, Md. Said to be the longest overhead scale track section ever built. American Girder Rail used for scale section. Used for weighing wings and other parts. Will accommodate a wing section 42 feet long and 11½ feet wide. Its capacity is 2000 pounds at each end of the live rail. Scale is accurate to 8 ounces.*

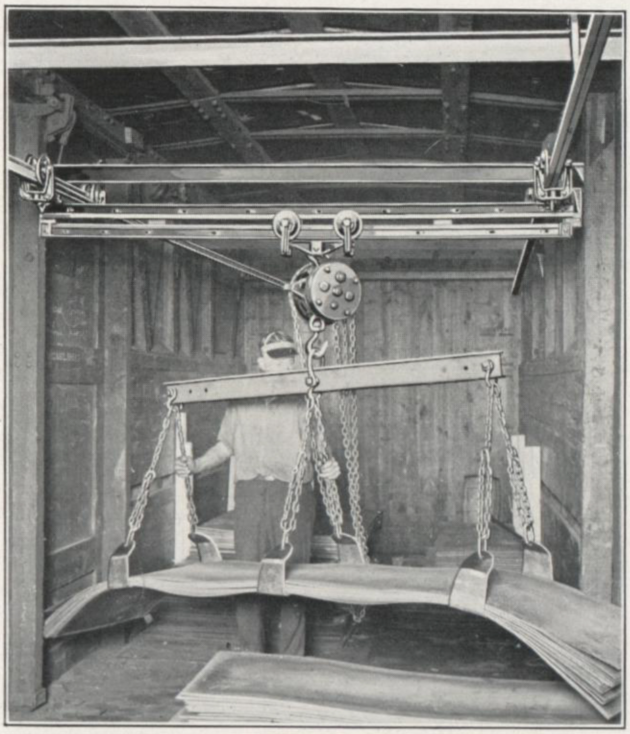


Fig. 145A

Fig. 145A *Handling sheets, loose or in bundles, made easy with this simple grab. Six point suspension. Chains permit adjustment.*

Fig. 145B *A sheet grab, slightly different, but simple in its application to the job of handling this class of material. Note that scale permits weighing of load as handled.*

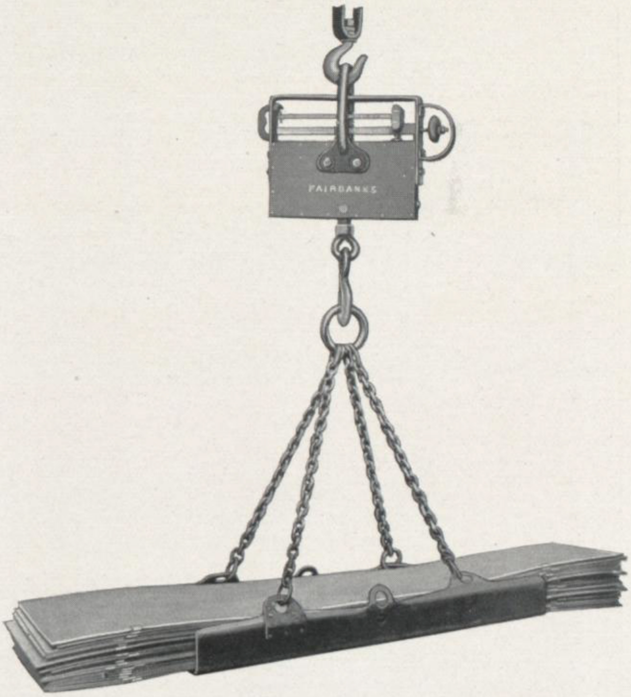


Fig. 145B

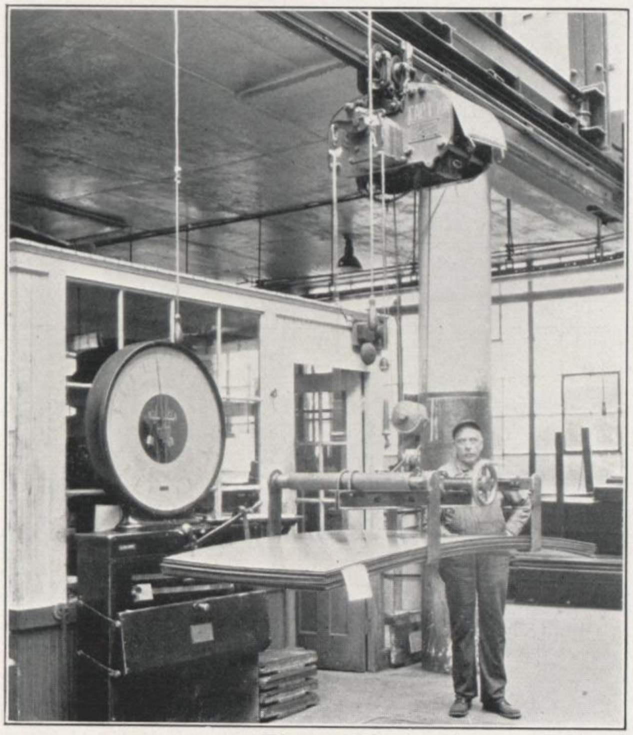


Fig. 145C

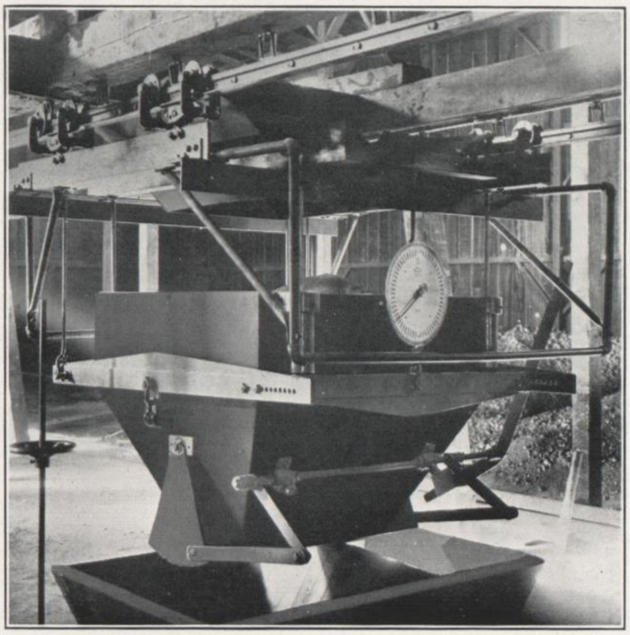


Fig. 145D

Fig. 145C *Screw operated, low-headroom sheet grab, easily operated by one man. Electric hoist used for lifting and handling bar stock and other material as well as sheets. Requires but 18″ of headroom including load.*

Fig. 145D *MonoRail-mounted weigh batcher built for the Richmond Pressed Brick Company, Richmond, Calif.*

Fig. 146A *Paper in rolls is a bulky and unwieldy load to handle. This paper grab handles rolls of paper averaging 1500 pounds. One man handles and tiers rolls.*

Fig. 146B *"Every Evening", a Wilmington, Delaware, newspaper, uses this grab with MonoRail equipment to handle its rolls of newsprint. One man handles and tiers these 1200 pound rolls with ease.*

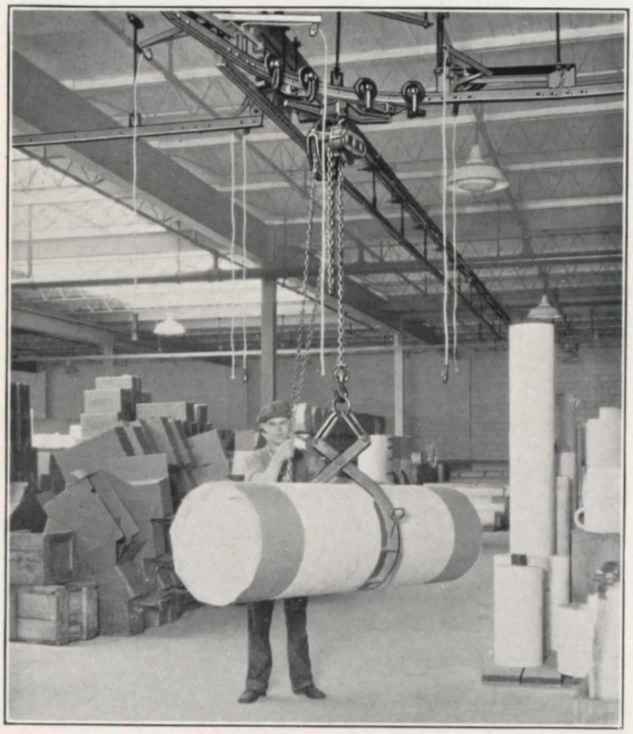


Fig. 146A

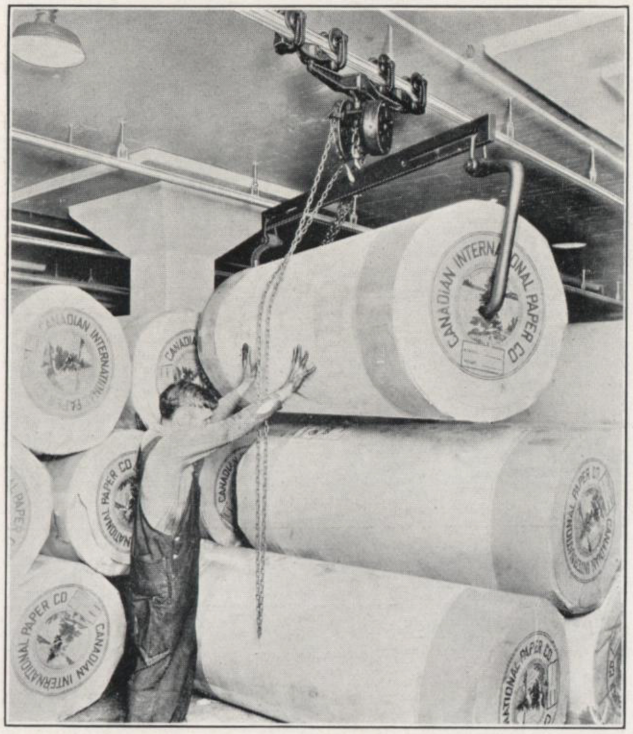


Fig. 146B

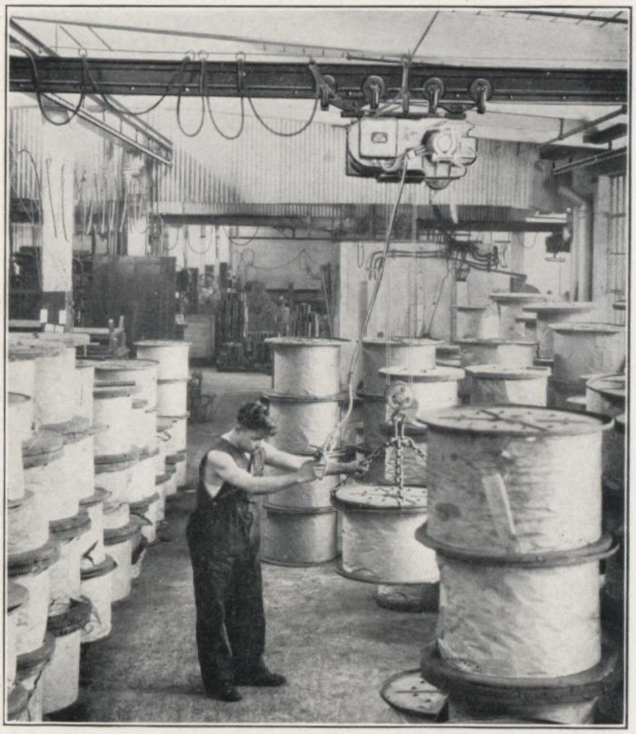


Fig. 146C

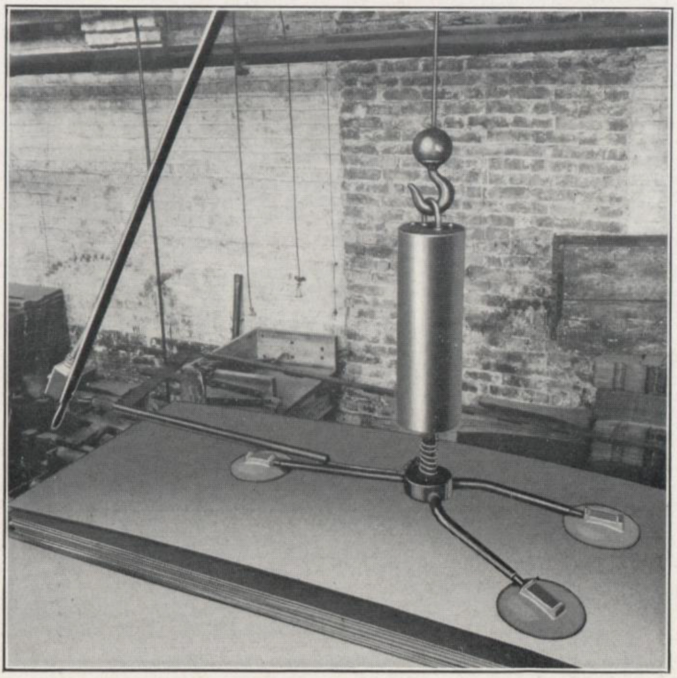


Fig. 146D

Fig. 146C *A chain grab for handling reels of insulated wire in the plant of the Okonite Company, Passaic, N. J. Note use of crane and electric hoist with looped, flexible cable conductor.*

Fig. 146D *A vacuum-operated grab used for handling sheets one by one. The rising of plunger in the cylinder exhausts air from under the suckers, giving them their grip on the sheet.*

Fig. 147A *Grab for drums of chlorine. Used by City of Cleveland, Ohio, water department. Lifted by electric hoist mounted on specially designed carrier. Filled steel drums weigh 1800 pounds each.*

Fig. 147B *The Horace E. Dodge Boat & Plane Corp., at Newport News, Va., uses this grab to handle mahogany boat bodies between operations. Boats are handled throughout the plant on a system comprising more than a mile of MonoRail.*

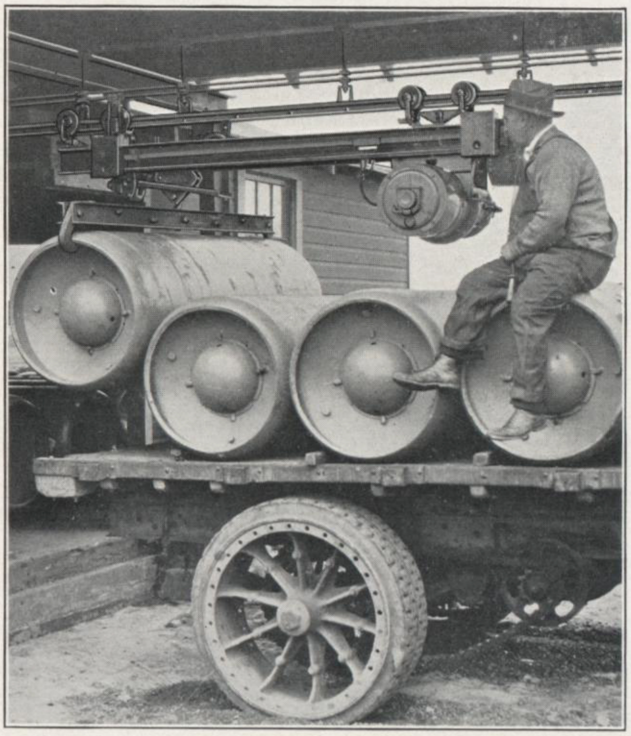


Fig. 147A

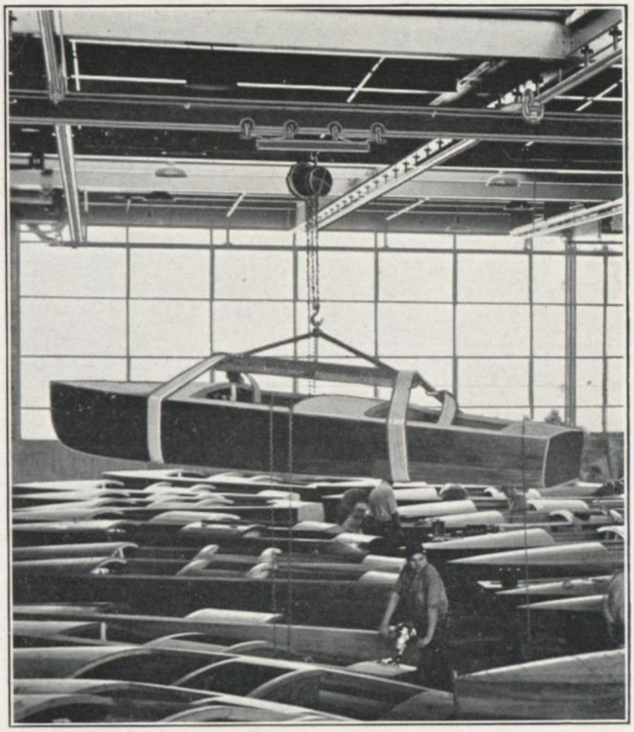


Fig. 147B

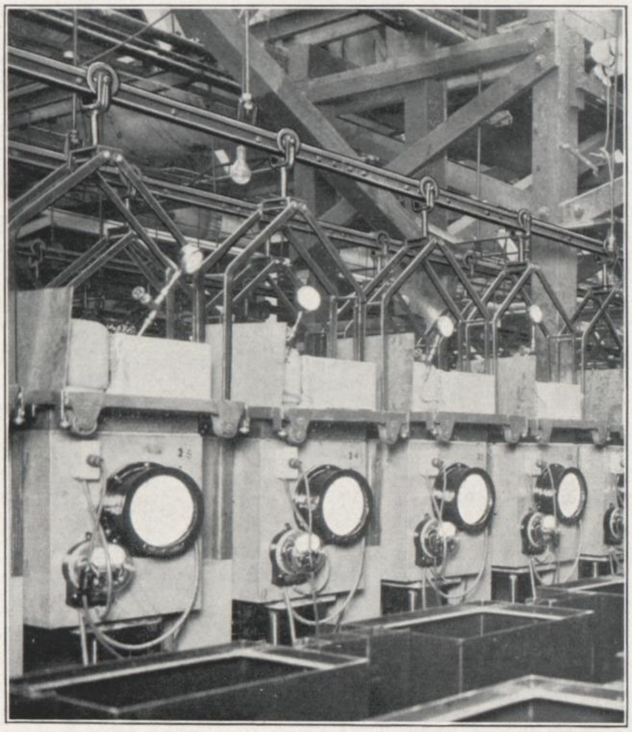


Fig. 147C

Fig.147C *Specially designed grabs used by the Grigsby-Grunow Co., Chicago, to handle electric refrigerator parts throughout testing and production operations.*

Fig. 147D *Grab used to handle material into plating tanks in the plant of the Great Lakes Plating Company, Chicago. Note also trackage arrangement providing spur over each tank.*

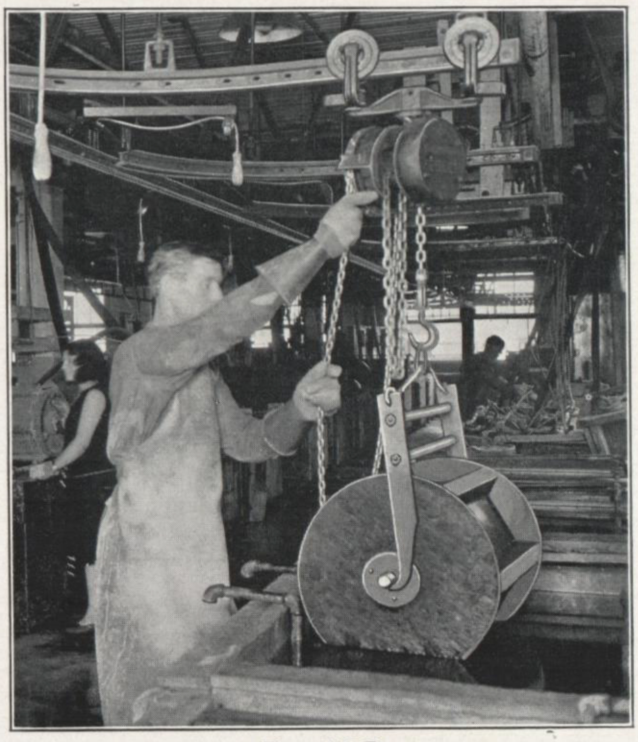


Fig. 147D

Fig. 148A *Chain used as package grab in balcony storage of steel in the Edgar T. Ward Sons Company, Cleveland. Load shown was picked up on floor below. See page 53, Fig. 53A.*

Fig. 148B *Motor truck engines are handled by this grab in the Autocar plant at Ardmore, Pa. One of six installations in this plant.*

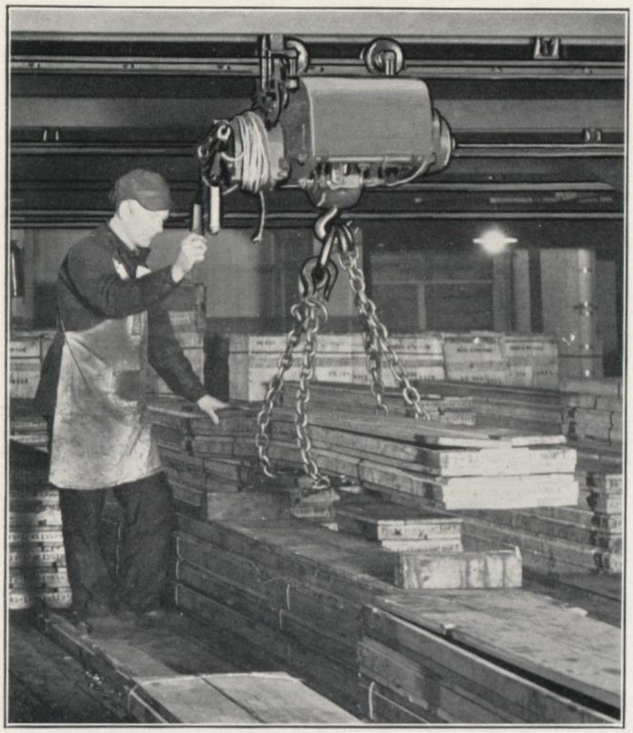


Fig. 148A

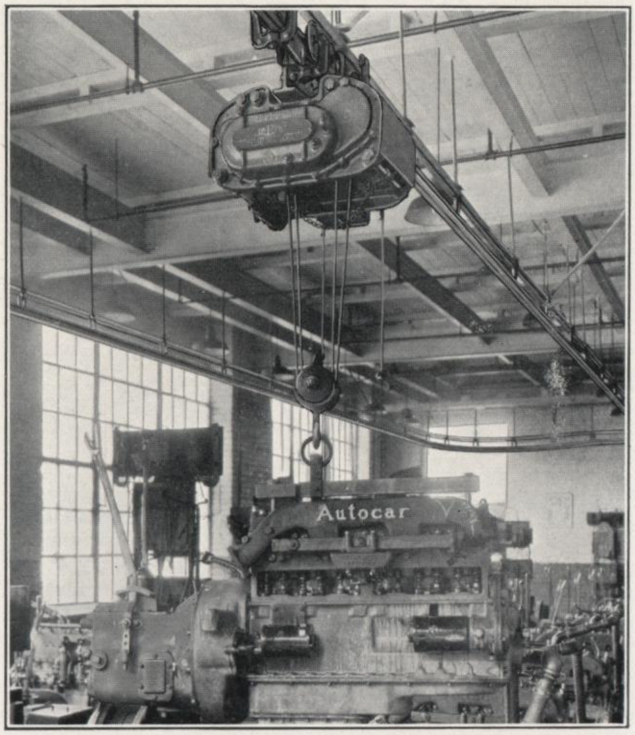


Fig. 148B

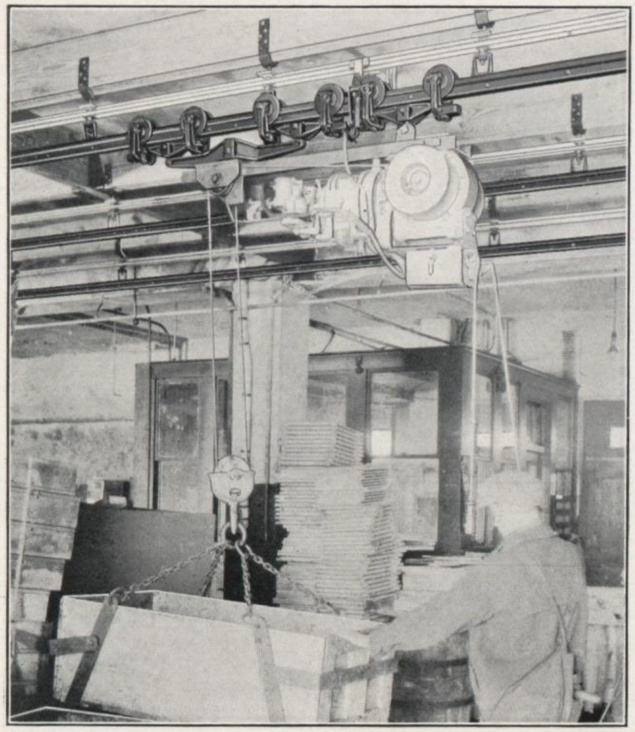


Fig. 148C

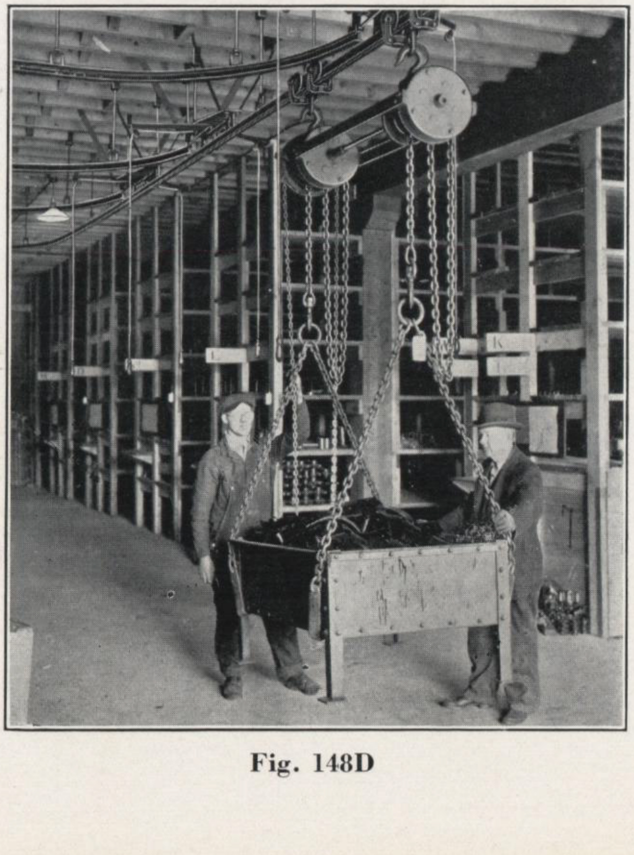


Fig. 148D

Fig. 148C *A box grab used in the plant of the Booth Fisheries, Boston, Massachusetts.*

Fig. 148D *Factory Tote Box carried by MonoRail Grab in the plant of the Caterpillar Tractor Company, Minneapolis, Minn. One of MonoRail's heavy handling jobs in this plant.*

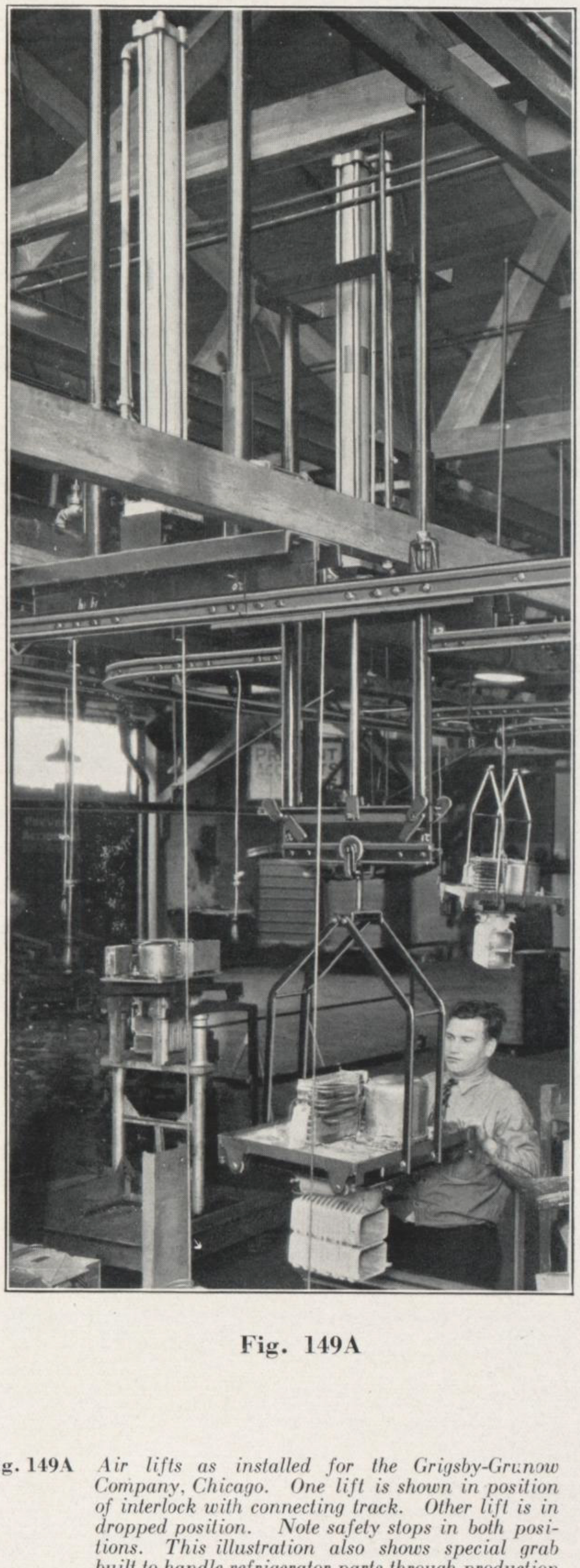


Fig. 149A

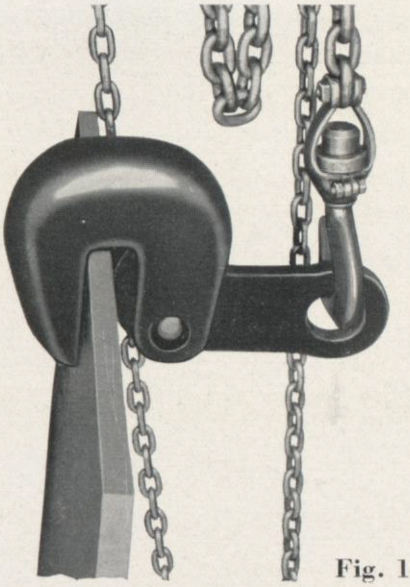


Fig. 149B

Fig. 149B *Plate Grab.*

Fig. 149C *Sheet Grab.*

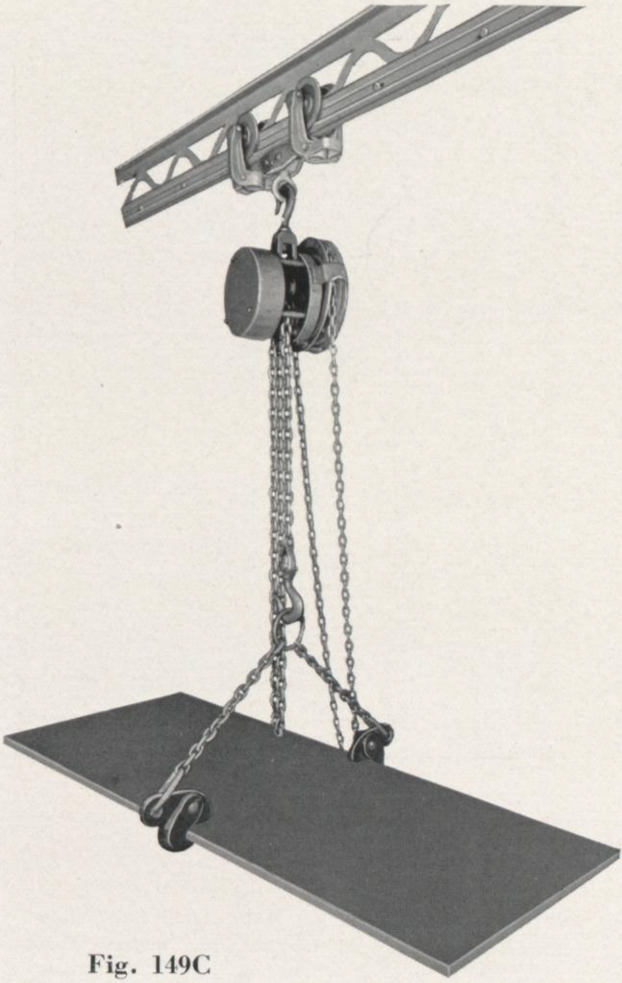


Fig. 149C

Fig. 149A *Air lifts as installed for the Grigsby-Grunow Company, Chicago. One lift is shown in position of interlock with connecting track. Other lift is in dropped position. Note safety stops in both positions. This illustration also shows special grab built to handle refrigerator parts through production and assembly.*

Fig. 150A *Metal baskets carried by MonoRail system handle cans of beans and other food products through cooking and cooling operations in Friend's Bean Bakery, Boston, Mass.*

Fig. 150B *Special carrier built to handle high grade furniture through finishing operations. Perfect freedom from liability of damage in handling.*

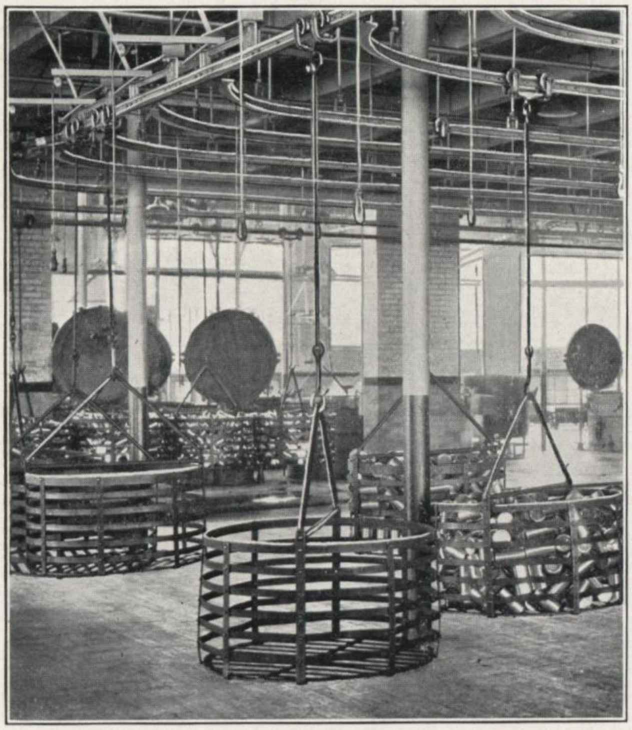


Fig. 150A

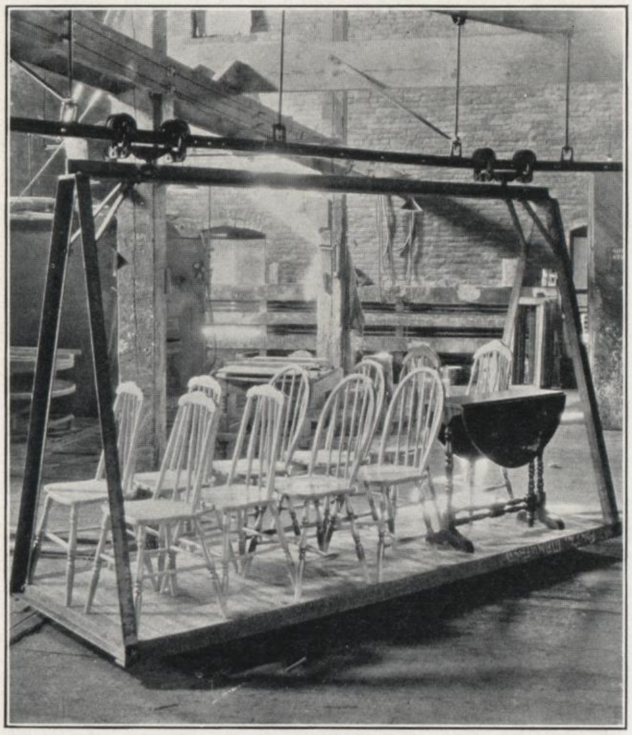


Fig. 150B

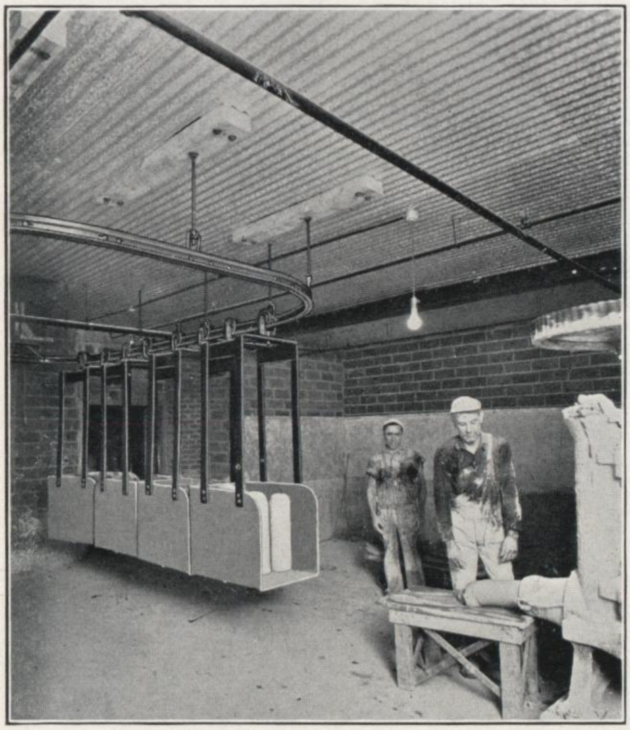


Fig. 150C

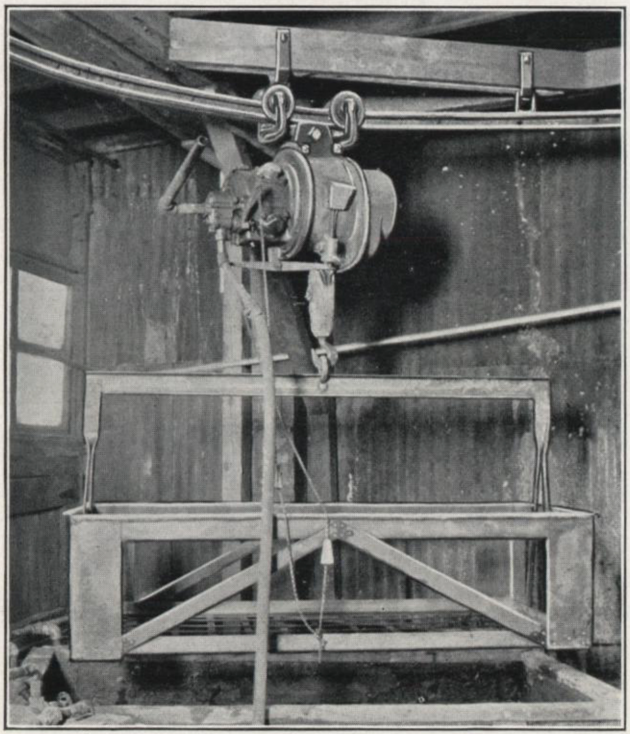


Fig. 150D

Fig. 150C *Special carriers, stored on loop, which carry rolls from pug mill on right, to lift where they are taken to floor above. Empty carriers are returned to lower floor by lift. Bailey-Walker China Co., Bedford, Ohio.*

Fig. 150D *Dipping basket used by the Karr Range Company, Belleville, Illinois. Note the use of the air-motor hoist in this installation.*

Fig. 151A *Hairpin type carrier rack handling bottled milk in cases in plant of Borden Milk Company, Chicago. Cases are stacked on skids and handled from truck to cooling room without rehandling. Carrier will handle 25 quart or 40 pint cases.*

Fig. 151B *Racks loaded with small parts, carried by Mono-Rail system, pass through japanning ovens.*

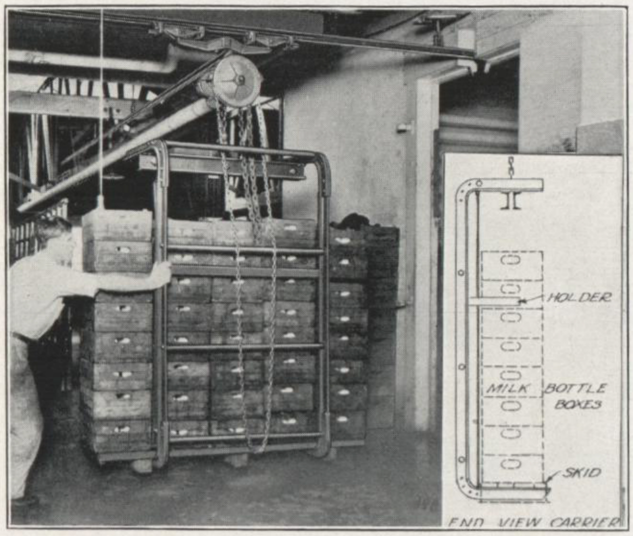


Fig. 151A

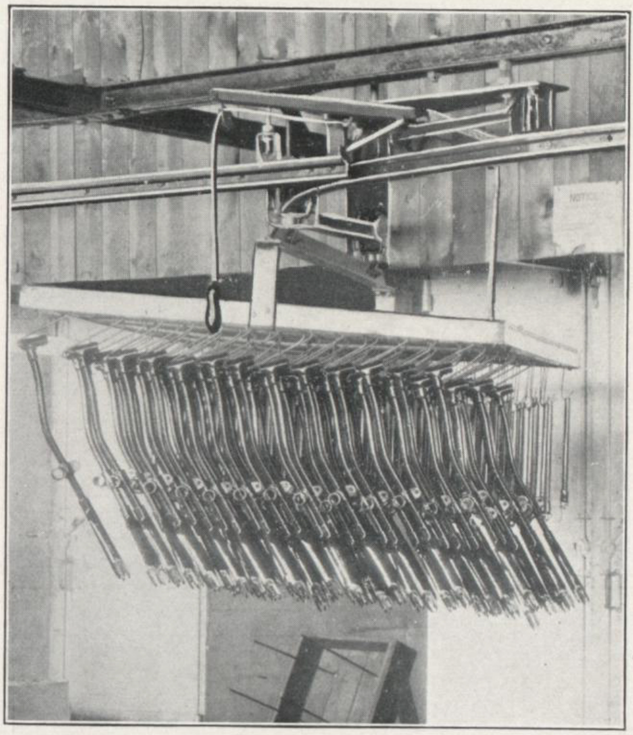


Fig. 151B

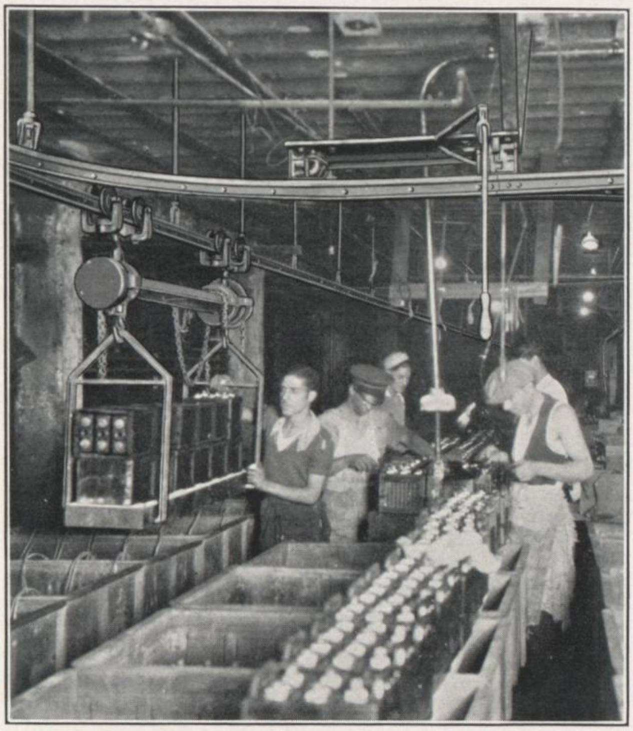


Fig. 151C

Fig. 151C *Racks used for handling storage batteries through entire process of manufacture, test, storage, etc. Equipment protected against acid atmosphere shows no signs of rust after three years of service. Lyons Storage Battery Co., Belleville, N. J.*

Fig. 151D *Filing cabinets, steel lockers, safes and similar products handled by these racks without damage to finish in the plant of the Steel Equipment Corp., Avenel, N. J. Note load carried by twin hook hoist.*

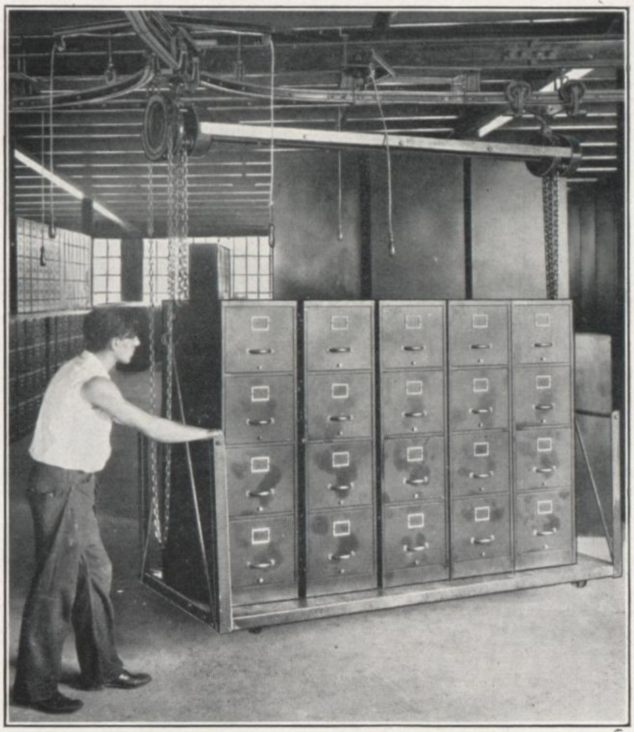


Fig. 151D

Fig. 152A *Carrier rack for handling porcelain articles in the plant of the Washington Porcelain Co., Washington, N. J. Rack is shown with pallets removed. Rack may be removed from trolleys for storage.*

Fig. 152B *Porcelain carrier rack, with loaded pallets in place.*

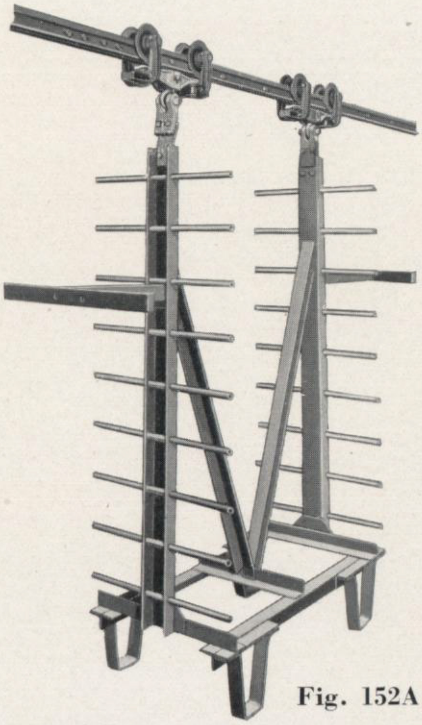


Fig. 152A

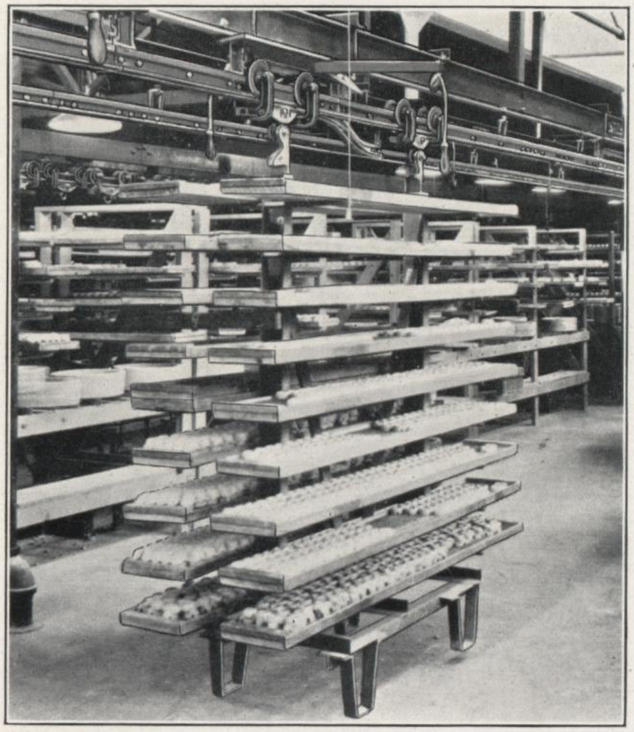


Fig. 152B

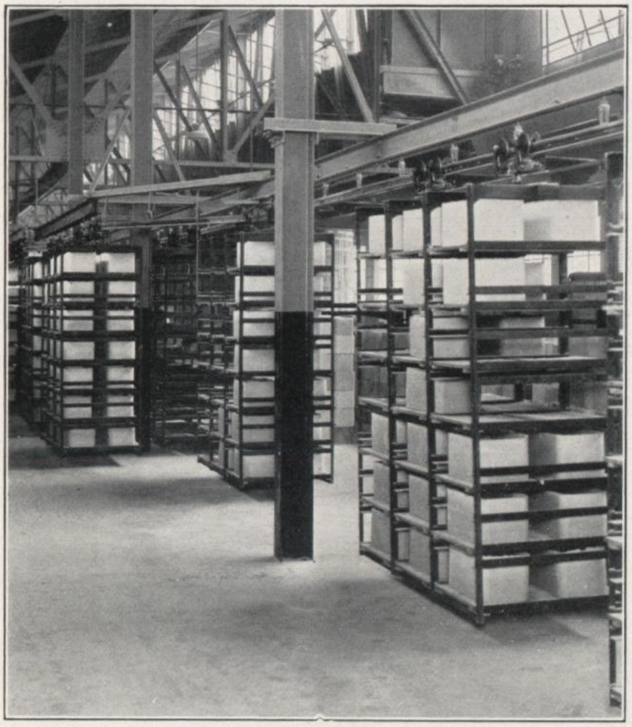


Fig. 152C

Fig. 152C *The Cambridge Tile Company, Cincinnati, Ohio, uses racks of the type shown above to handle saggers from the sagger press room through the baking oven.*

Fig. 152D *Trunnions on the buckets used in this garbage reduction plant furnish an attaching point for an electrically-lifted grab.*

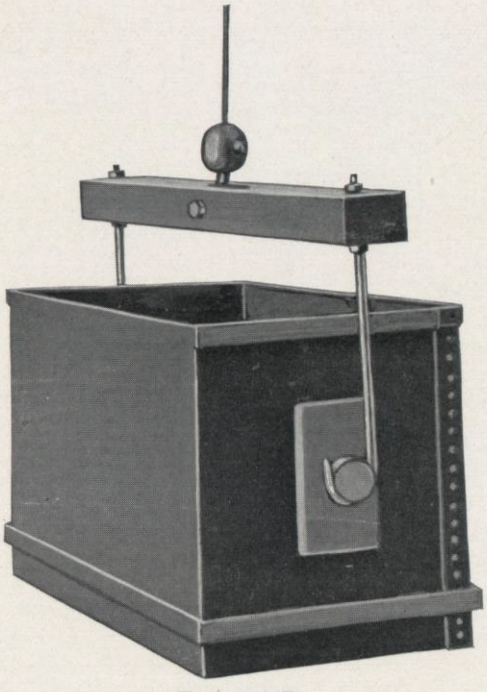


Fig. 152D

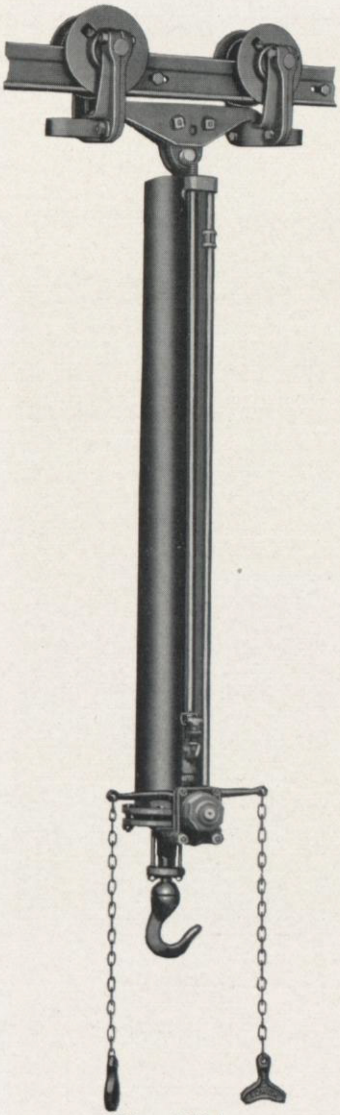


Fig. 153A

Fig. 153A *Curtiss Air Hoist, mounted on MonoRail trolley. An efficient economical handling unit over small areas.*

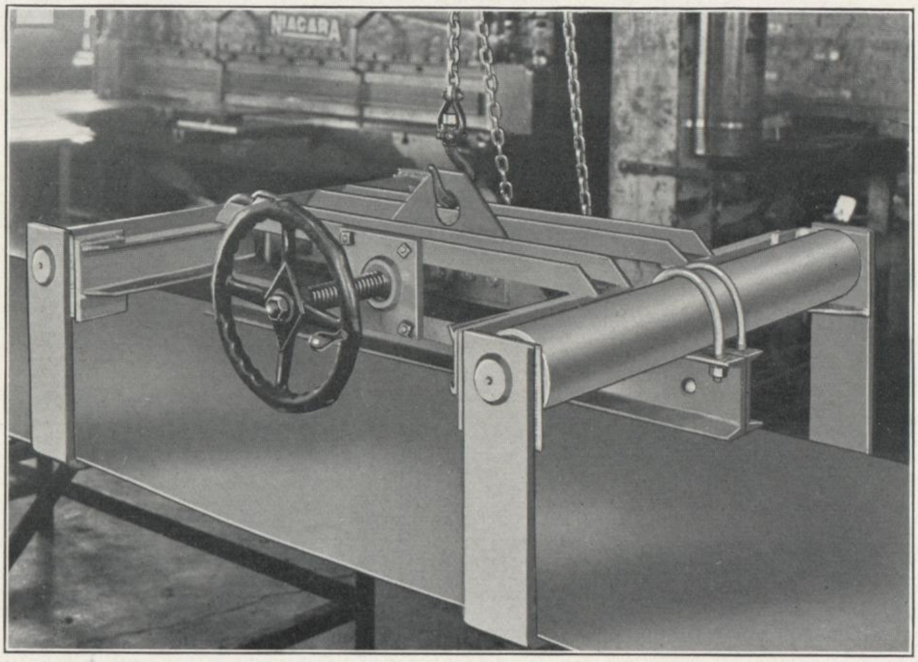


Fig. 153B

Fig. 153B *Sheet grab of the screw type. Handles sheets singly or in stacks. Positive in operation. A labor-saving device. See also page 145 for further description.*

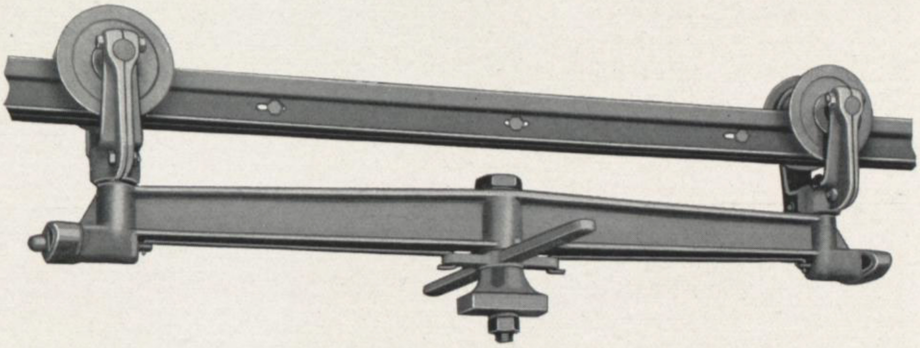


Fig. 153C

Fig. 153C *Specially designed trolley for handling racks. Note latching device for racks carried on swivel.*

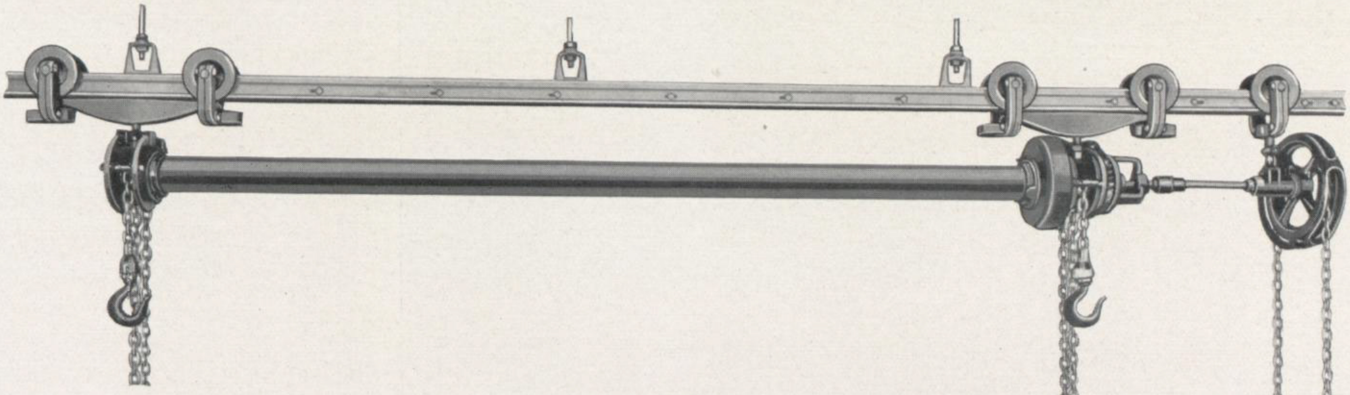


Fig. 153D

Fig. 153D *Twin Hook Hoist, with extended Hand Chain Wheel. Hoist specially designed to handle automobile bodies.*

Chain Driven Trolleys

Trolleys linked together by drive chains and fitted with load carrying devices of great diversity are used in production plants for moving, storage, dipping, drying, processing, assembly and testing purposes. Where this method of handling will apply, substantial savings may be made both in handling the product and in savings in factory floor space required. Convenience to operators and freedom from damage to the product are important results that may be obtained incidentally. But the first cost of such an installation is very often less than is required for handling the material by other methods.

American MonoRail trolleys are adapted to use on chain driven systems either as single units in various trolley sizes and load capacities or in double trolley units where loads may require. There are trolley combinations to fit any load without overloading. This important flexibility means not only adaptability to a wide range of products but long wear and freedom from trouble over long periods of time.

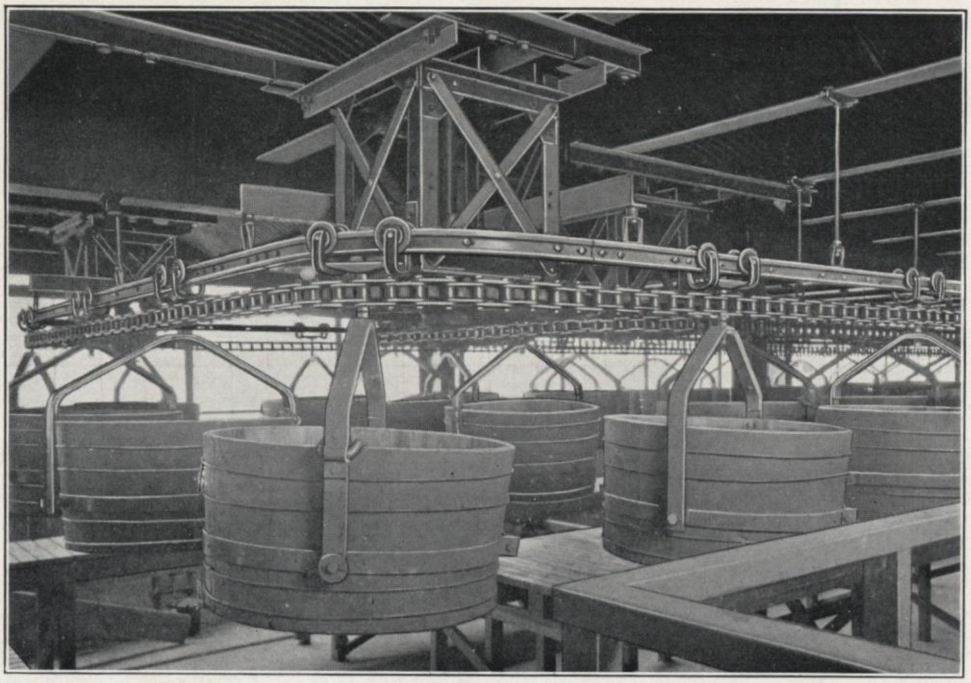


Fig. 154A

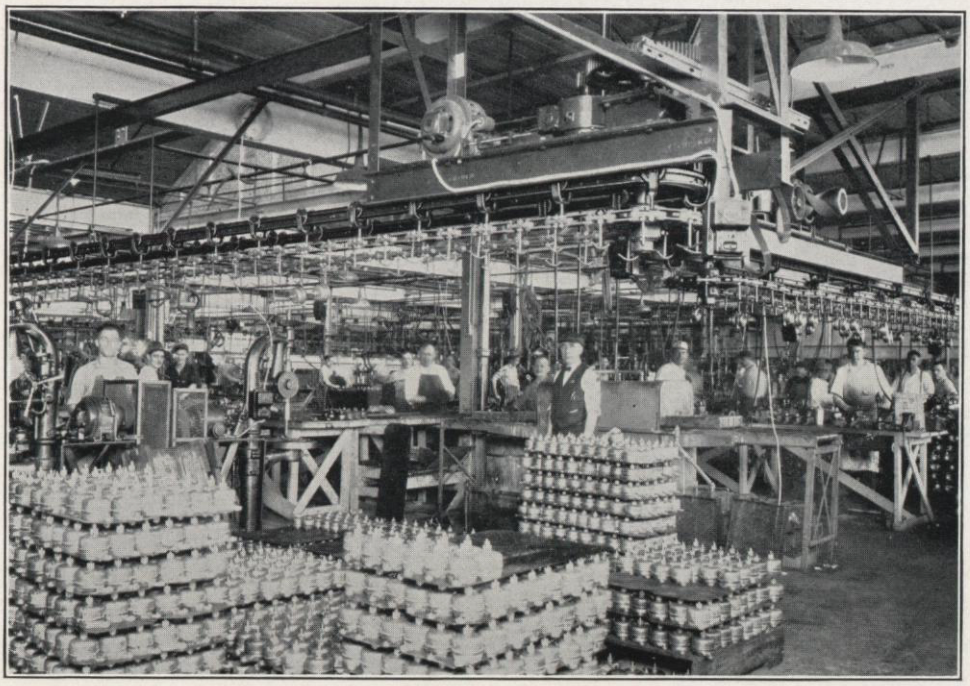


Fig. 154B

Overhead storage of parts and assemblies in process has three important advantages. First—it releases floor space for manufacture and prevents aisle jamming. Second—it eliminates handling processes incidental to floor transportation. Trolleys are arranged to pass machine operators in a position convenient for hanging up or removing parts from carriers which pass at a prearranged speed. Third—storage on overhead trolleys may be arranged to form a "cushion" to adjust the irregularities in time between different operations on small parts where hundreds or thousands may be carried in reserve along the flow line of production.

Dipping, drying and processing are accomplished by running the line of moving materials through tanks or drying or processing rooms or tunnels. The delivery end of the run may require drips or a length of MonoRail after leaving ovens to allow the product to cool, particularly if the chain moves rapidly. Dips may be arranged successively or in line with dryer as required or the movement may be from one level to another as may be necessary.

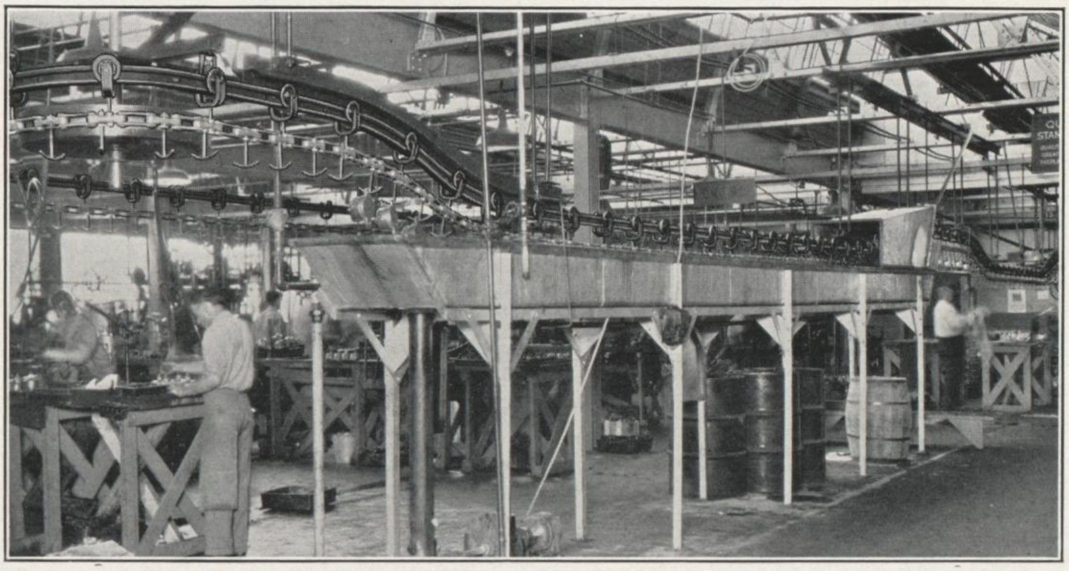


Fig. 155A

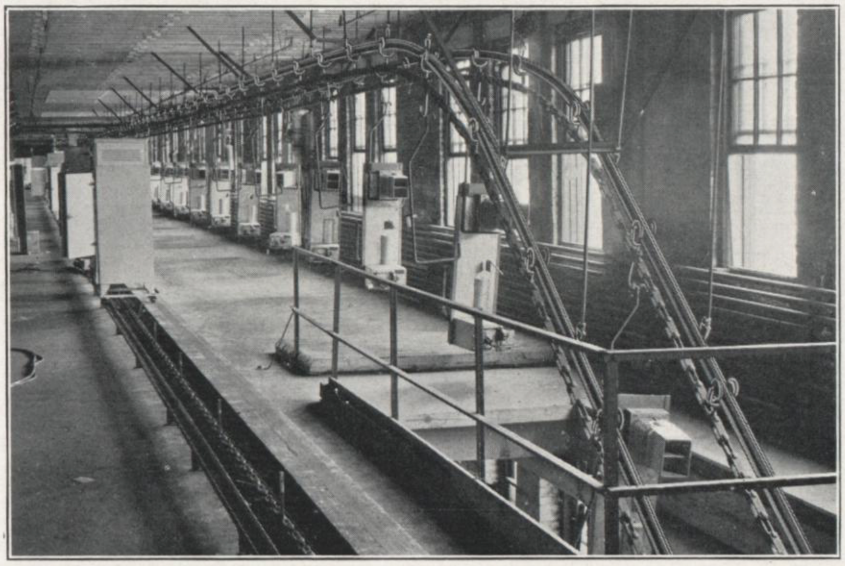


Fig. 155B

Inter-building and inter-plant transportation often may be accomplished by chain driven MonoRail at a very low unit cost in cases where a larger number of units are to be moved. First cost is the principal cost involved since upkeep is very small and labor cost is almost eliminated. Futhermore, the units may be picked up or laid down at the points most convenient in the plant.

Sometimes changes in level will allow the use of trolleys operated by gravity or by gravity and boosters. This method is described on the following page.

Transportation of parts and assemblies from one part of a plant to another in an orderly manner with an almost negligible cost is standard practice with chain driven MonoRail and requires no discussion. Assembly operations on parts moving along on a chain are likewise common when the production justifies and product is adapted to this method of saving of time and labor.

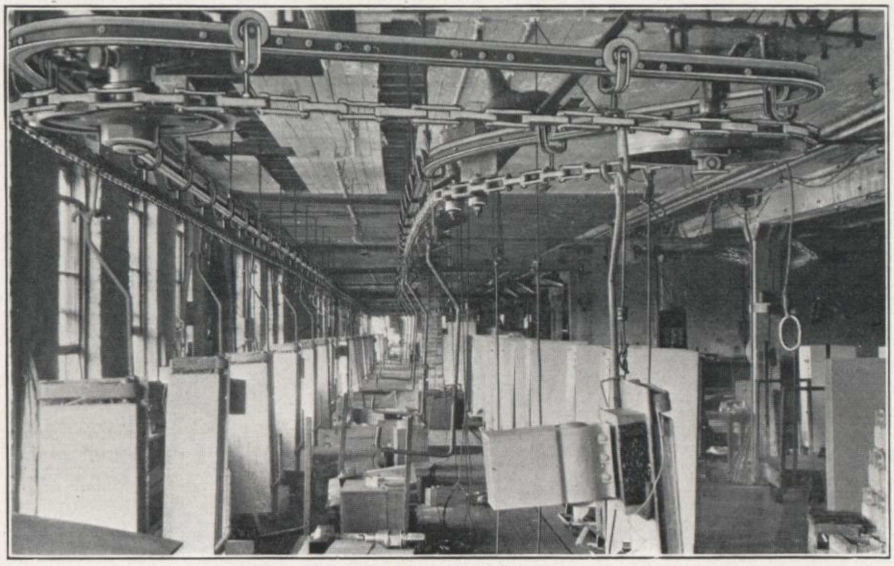


Fig. 155C

Booster and Gravity Trolley Systems

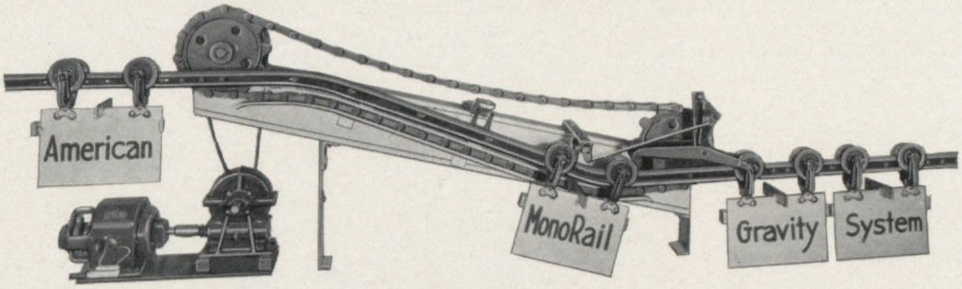


Fig. 156A

Manufacturing processes often will not permit the uniform and constant flow of materials in process as is obtained with chain driven trolleys and other methods must be used. Independent handling of loads is usually necessary at certain points in a system, or storage on the moving line may be impractical, and the first cost and upkeep of a chain driven system may not be justified where only a small section or sections of the MonoRail requires moving the loads mechanically.

Boosters or combinations of gravity runs with boosters will often apply in such cases. Boosters also apply where there is a difference in track levels, and the number of loads to be moved from one level to the other is too great to make a standard lift practical. In some instances uniform regular movement of trolleys is necessary only at certain points for assembly, dipping, drying or processing while at other points the loads must be handled independently. Gravity runs may often be introduced into the system to carry the loads from point to point as required.

Systems of this kind allow for shunting loads to several lines where it is desirable for classification, assembly or storage, or to provide for possible interruptions at any point in the line of flow without disturbing the manufacturing system.

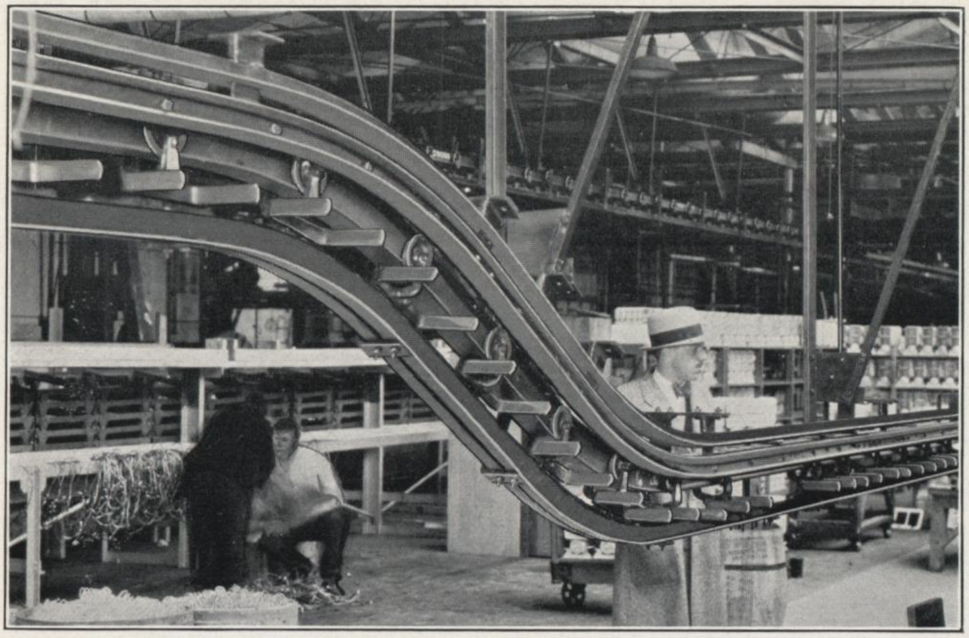


Fig. 156B *Shows a heavy service chain driven trolley type of booster paralleling standard MonoRail. Note the projecting pushers which engage with and propel trolleys or hold them from running wild on down slopes.*

American MonoRail engineers have designed efficient trolley boosters which carry loaded trolleys up and down slopes or move them along horizontal lines. They have developed a special escapement mechanism for feeding trolleys into boosters which is automatic in operation and makes it unnecessary for an operator to feed the trolleys into the boosters by hand. It is immaterial whether the loads are heavy or light or variable or whether or not there are many or few trolleys waiting to enter the booster. This combination of pusher and feeder has greatly extended the useful-

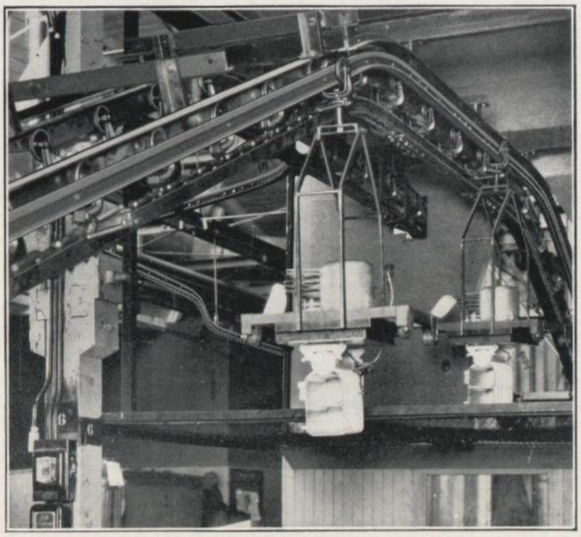


Fig. 156C *Loaded trolleys in the flow lines of production sometimes pass obstructions or aisles where interferences must be avoided. Boosters to push the loaded trolleys over these points are used as shown in the accompanying picture.*

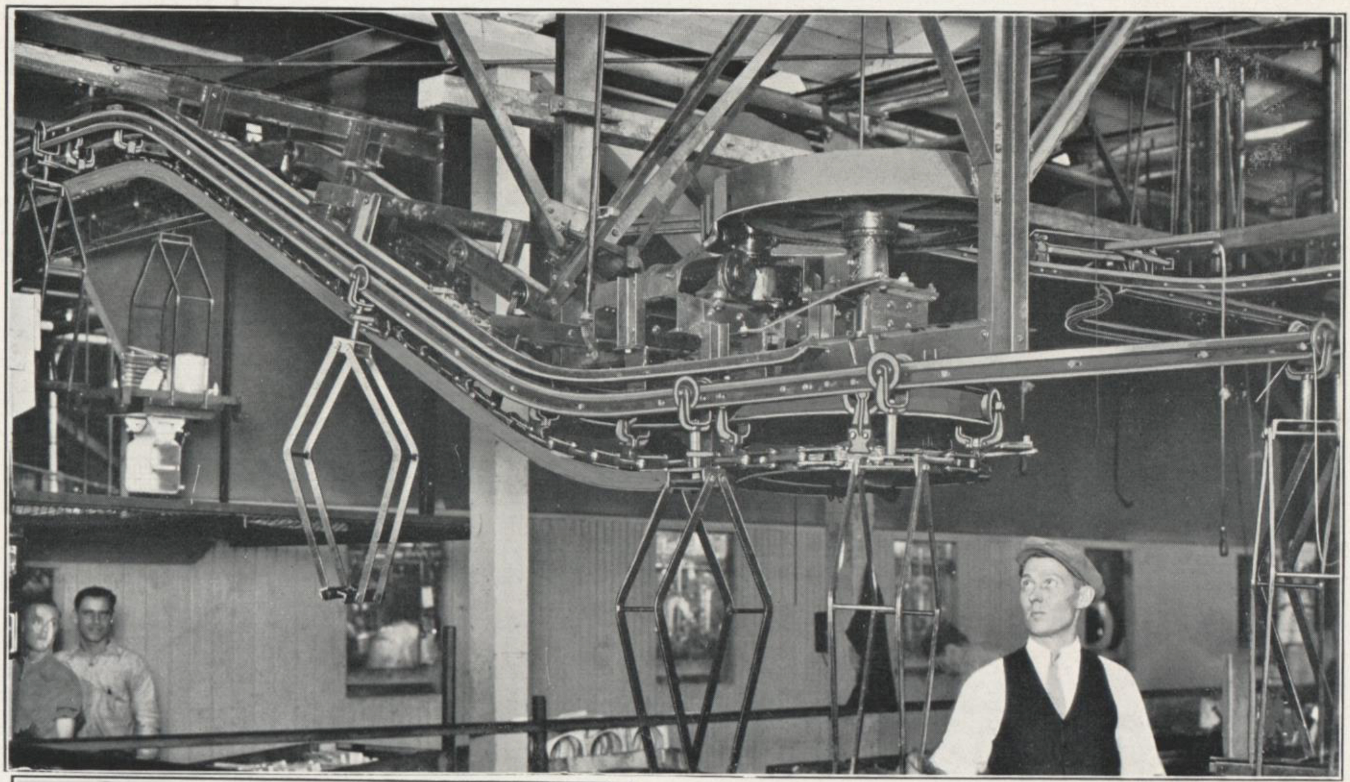


Fig. 157A

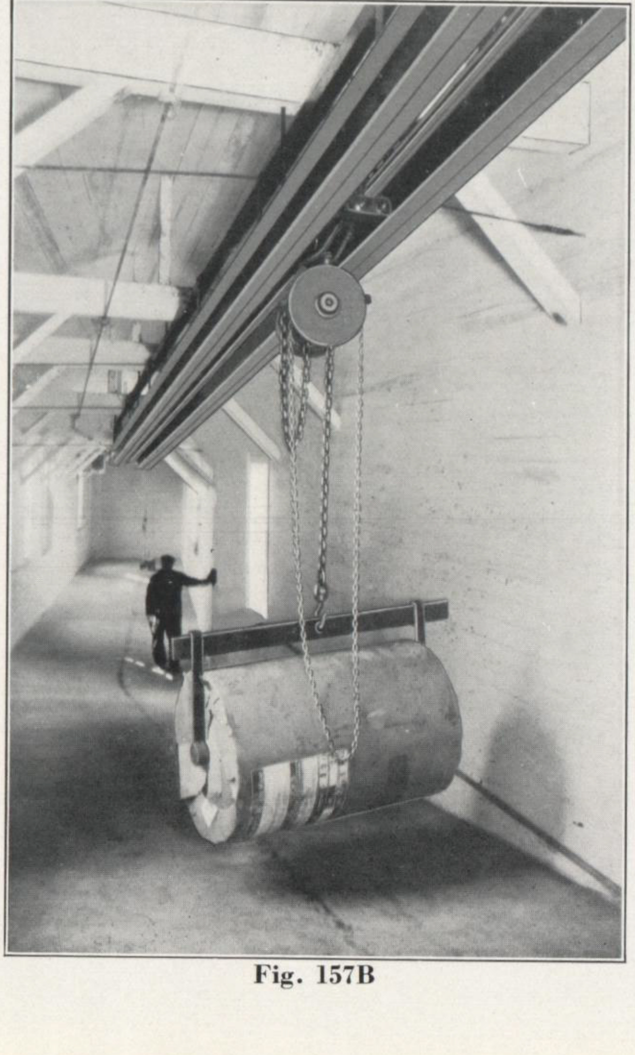


Fig. 157B

ness and savings possible with gravity runs of MonoRail as trolleys may be carried by gravity for a considerable distance from the last handling point, and do not have to be watched or fed into the booster by hand to prevent jamming, or double feeding as might occur where the feeder is not used.

Returning empty carriers to the point of origin after the load has been removed is a common application of boosters and gravity lines.

No general rules can be made governing the slope required for trolleys to operate on sloping track. This depends upon the type of trolley, the wheel form and bearing, and the size, weight and hookup of the load. Some trolleys may require a quarter inch slope to the foot while another may run easily with one-sixteenth of an inch slope per foot of rail. Curves require more drop than straight rail and considerably less slope is necessary after a system is "worn in" than is required when the system is "brand new". It is usually possible to anticipate pretty closely the slope required when the type of load and trolleys are known, then to adjust the system to the exact slope required by using the thread adjustment on American MonoRail hanger bolts. MonoRail engineers will co-operate in booster and gravity layouts upon request.

Paint and Finishes on MonoRail Equipment

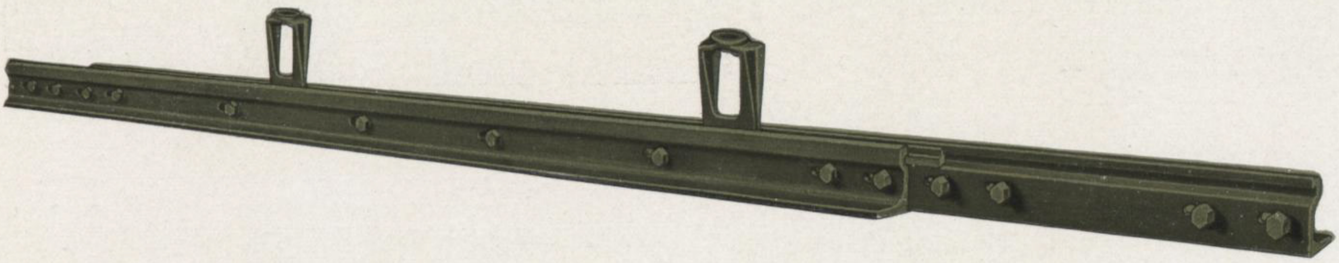
The standard finish on MonoRail equipment—Track, Trolleys, Switches, Cranes and all other equipment—is a dark green enamel paint, selected because of its proven virtue as a lasting protective covering for metals exposed to the widely varying atmospheric conditions that obtain in many industries.

The formula is one of long oil, high grade, waterproof and fume-resisting varnish in combination with chemically pure tinting colors. This paint is the best that can be secured for conditions that vary so greatly.

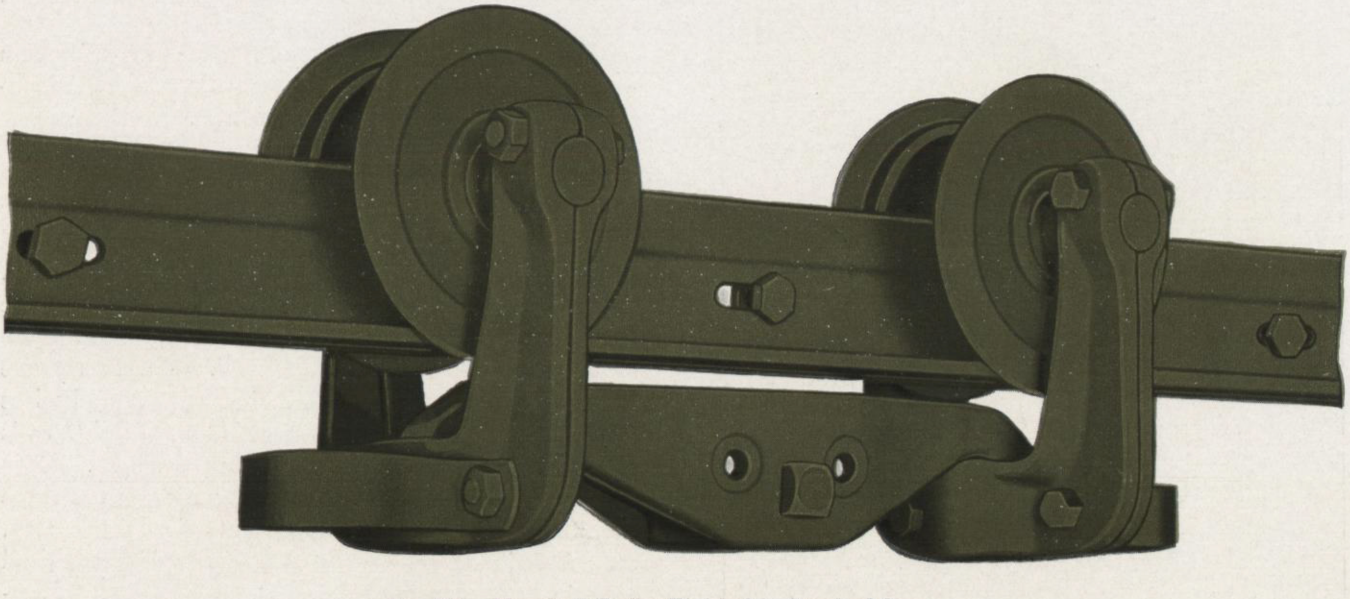
Where painting in special color is required, the same high-grade materials will be used, and an extra charge will be made to cover the actual expense.

If the equipment is going into service where it is subject to unusual attack by the enemies of iron or where acid fumes or other corrosive influences are present, we recommend special protective measures such as udyliting, galvanizing, or other corrosion-resisting coatings.

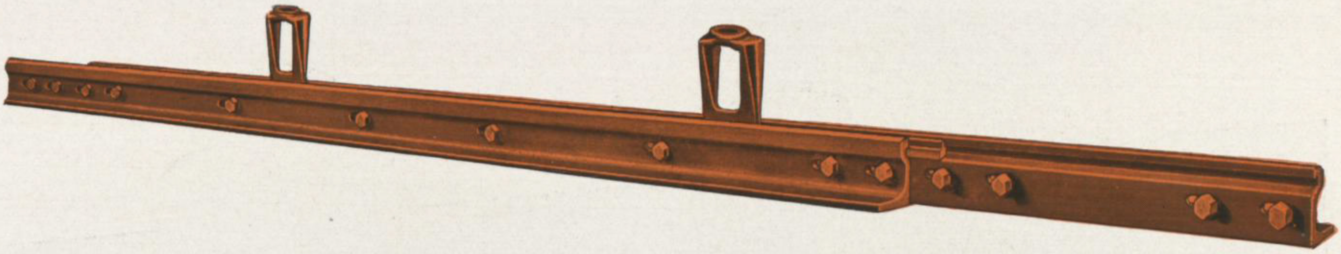
MonoRail engineers will make a study of the situation where unusual atmospheric conditions are present and will make recommendations and submit estimates of the cost of special treatment where it is required.



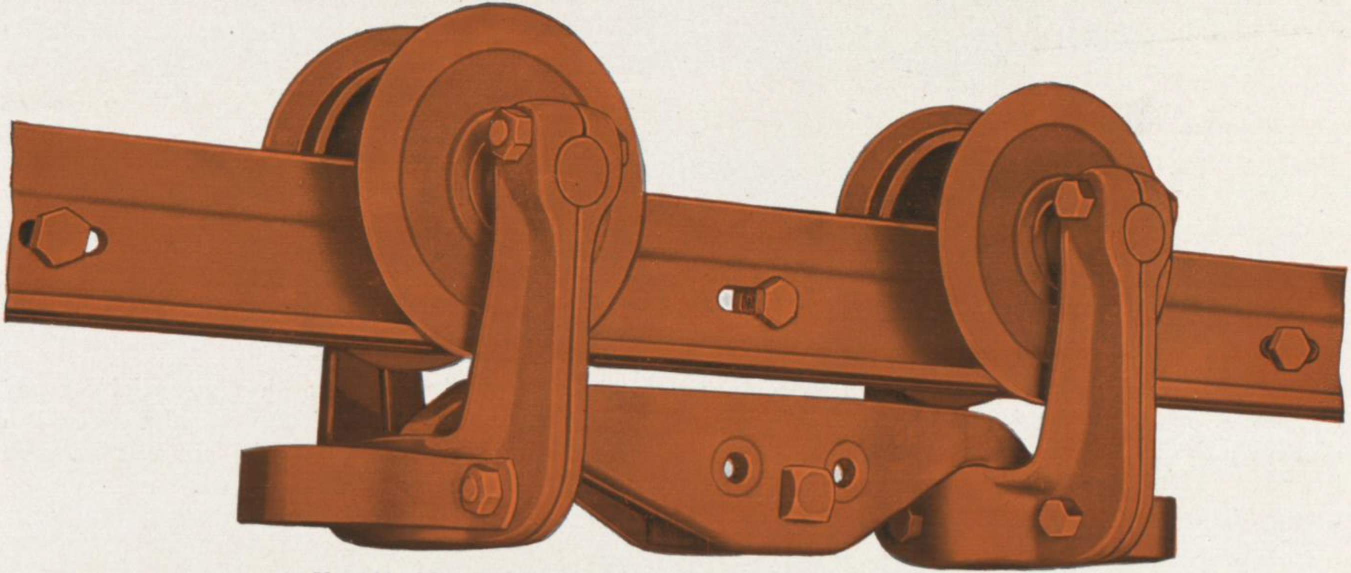
A-401 *Assembled MonoRail Finished in Standard Green.*



No. 165 *MonoRail Trolley Finished in Standard Green.*



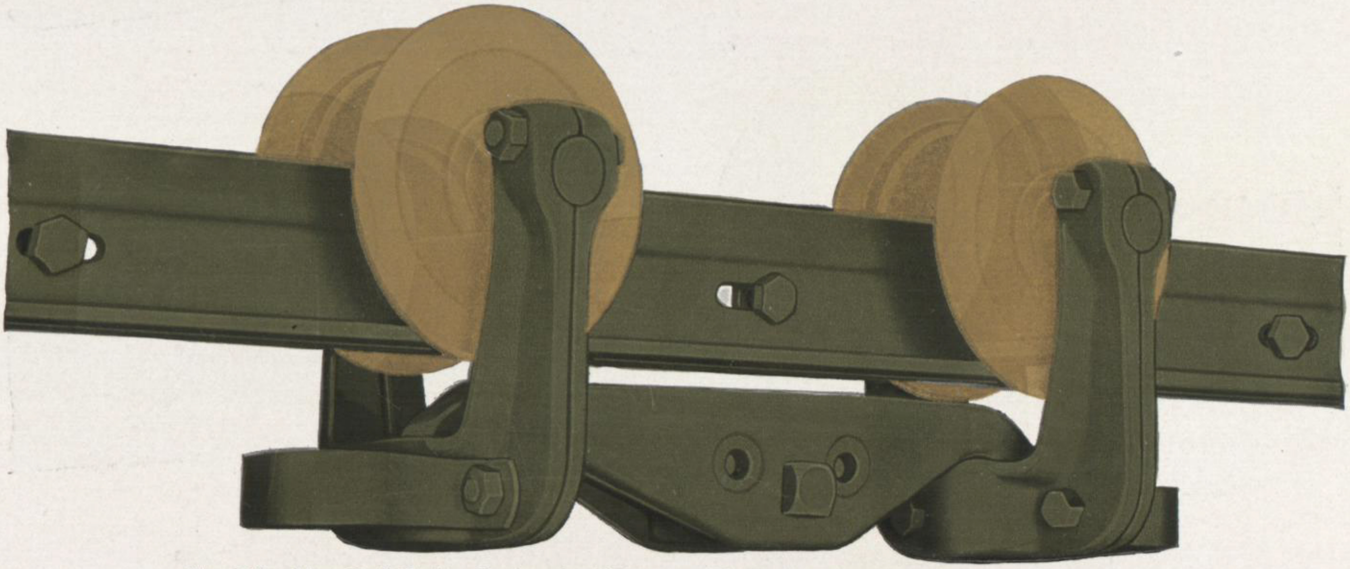
A-401 *Assembled MonoRail Finished in Dupont acid resisting Kromate.*



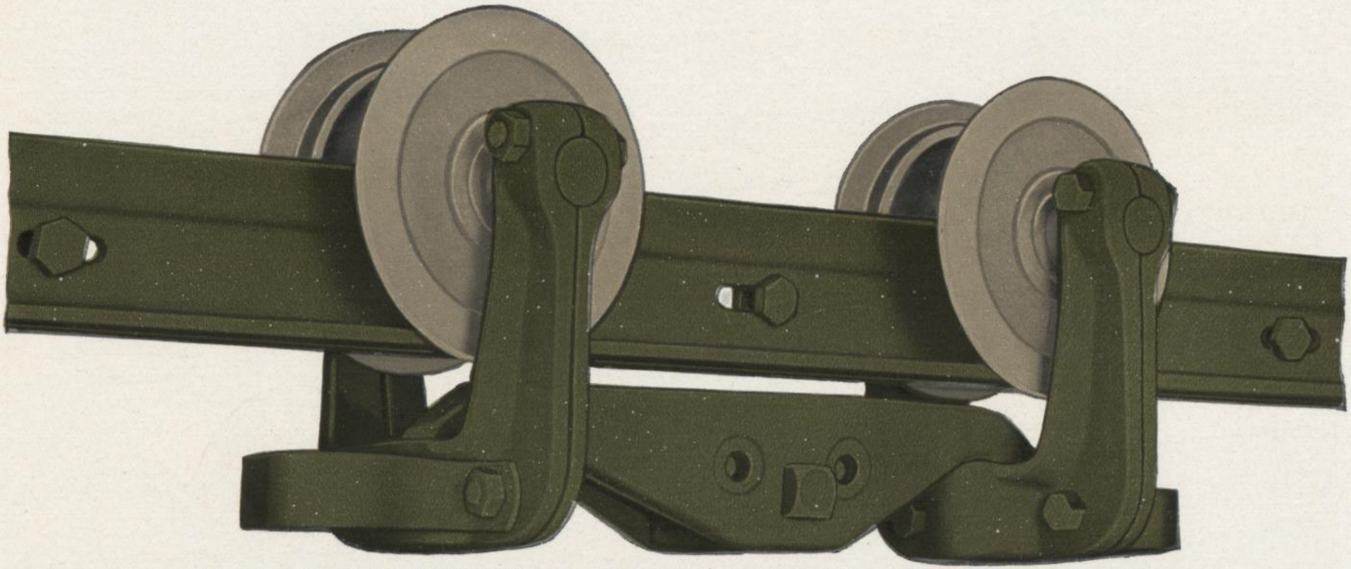
No. 165 *MonoRail Trolley Finished in Dupont acid resisting Kromate.*

MonoRail Trolleys Equipped With Special Wheels

MonoRail Trolleys will be equipped with wheels of special material such as bronze, aluminum, fibre, bakelite, where operating conditions require it, such as the presence of explosive dust, gases, gunpowder and the like. MonoRail engineers will on request make recommendations and give prices on special equipment of this type.



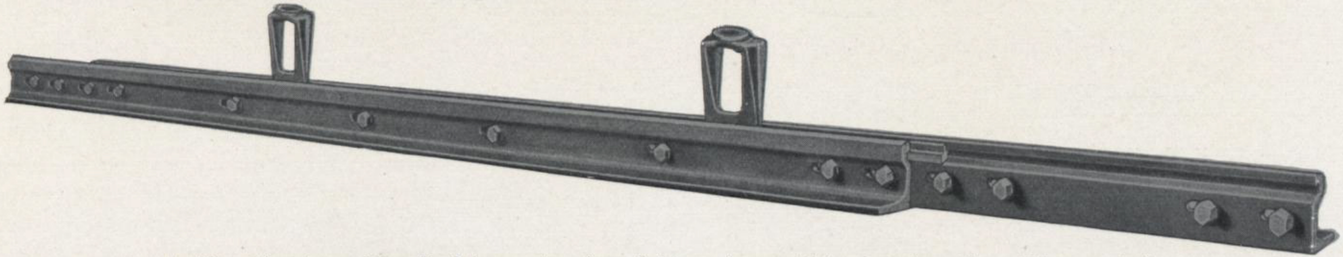
No. 165 *MonoRail Trolley Equipped with Bronze Wheels for situations where sparking must be avoided under explosive conditions.*



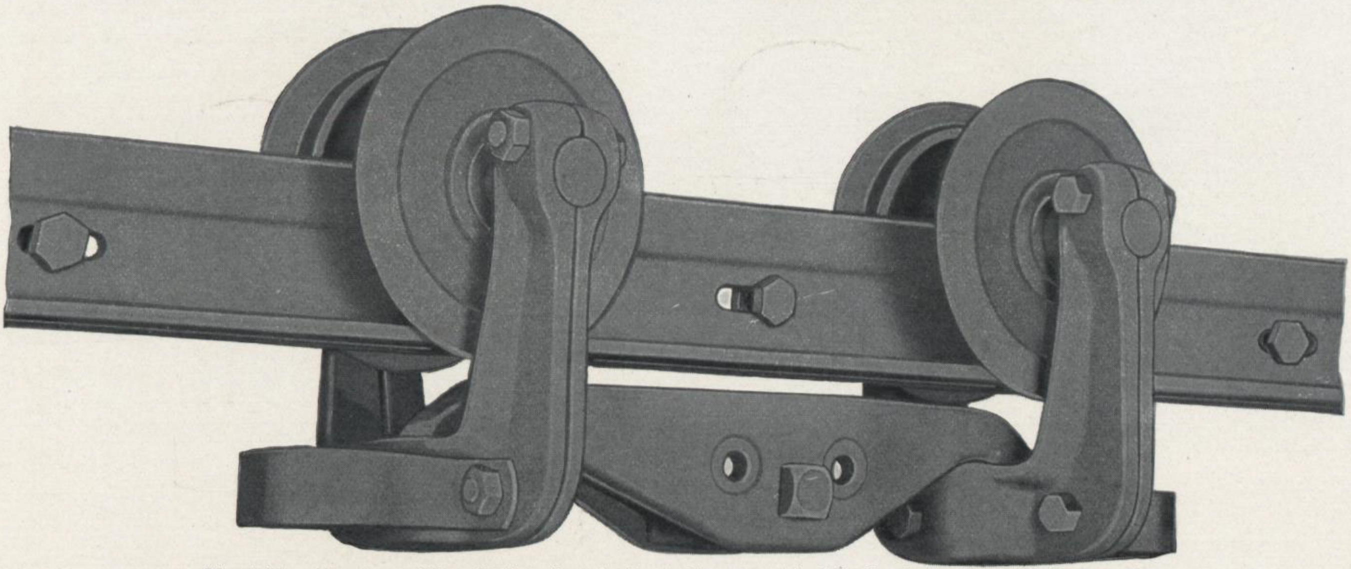
No. 165 *MonoRail Trolley with fibre wheels for use on installations where minute steel particles dislodged by steel wheels would be injurious to the product being manufactured.*

Aluminum Equipment for Lightness

MonoRail Equipment, track, trolleys and other equipment may be fabricated throughout from aluminum for those situations where a light-weight handling system is essential or where acid, or other corrosive atmospheric conditions are present as in certain process industries, such as artificial silk and the like. In aircraft of the Goodyear-Zeppelin type Aluminum MonoRail equipment was installed to handle motor parts and airplanes.



A-401 *Aluminum MonoRail for service where lightness is essential or certain acid conditions are bad.*



No. 165 *Aluminum MonoRail trolley similar to those furnished the Goodyear-Zeppelin Corporation. The udyliting process gives MonoRail equipment exactly the same appearance as shown in the illustration above.*

Box Car Loading Units

MonoRail Box Car Loading Units are designed for handling heavy and awkward materials which do not pile high, but are distributed over the car floor. They may be used either for loading or unloading. They will offer substantial reductions in handling costs where the number of cars received or shipped require the services of two or more men.

The Unloader consists essentially of a demountable craneway with supporting posts, spreaders, and brackets and a variable length demountable crane, all of light construction for easy handling and adjustable to fit cars of varying width, height and length.

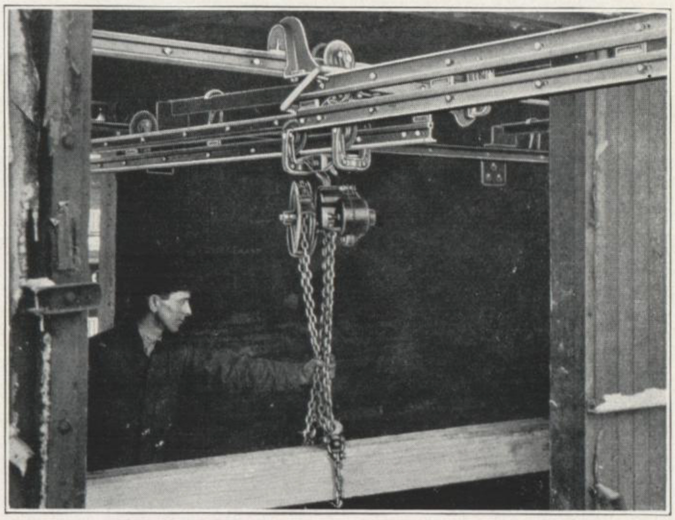


Fig. 161A *Loading box car with heavy boxed material*

The time required for mounting and dismantling the Loader in the car varies with the character of the material in the car, the type of car, and the training of the men who handle the equipment. Under favorable conditions two men have averaged fifteen minutes for mounting and dismantling, while in other cases forty-five minutes have been required.

It is necessary for MonoRail engineers to check into each application and make recommendations without obligation on your part.

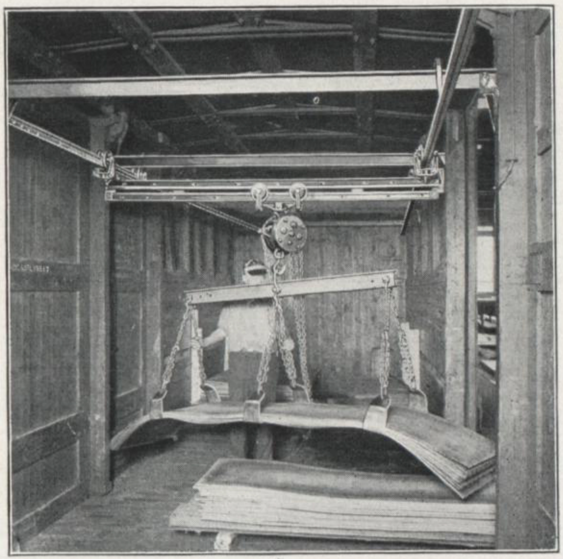


Fig. 161B *Unloading steel sheets from box car*

The Loader may be used to convey materials to and from the car door, or it may be arranged for interlocking with a MonoRail system leading throughout a plant or warehouse so that loads may be carried from car to plant or from storage to car floor on the same trolley without rehandling. The flexible design of the unit allows for shifting or settlement of the car as the loading or unloading proceeds.

The Unit is especially adapted for handling castings, motors, pumps, sheets, plates, pipes, bars, stones, blocks and heavy boxed material. It is ruggedly built and designed for handling loads up to one ton. The Unit is built of lighter or heavier construction according to the loads to be handled, and the total weight varies accordingly from 600 to 1100 pounds.

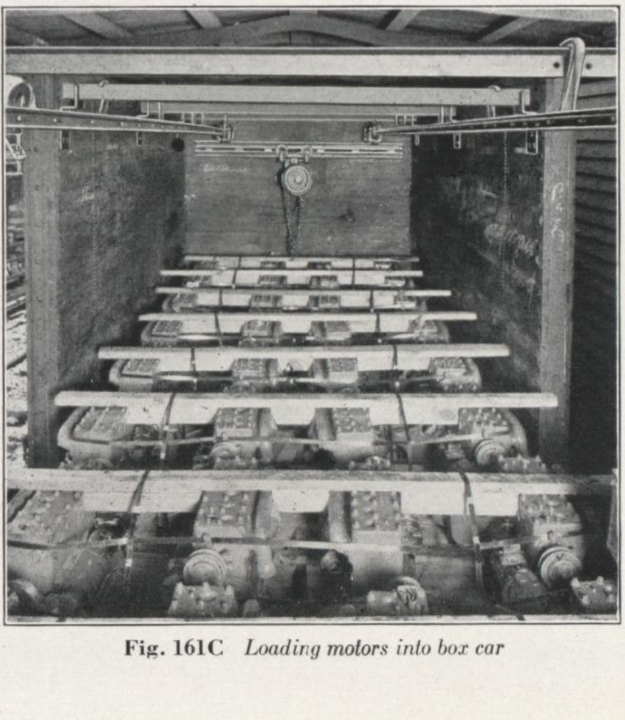


Fig. 161C *Loading motors into box car*

MonoRail Window Cleaning Equipment

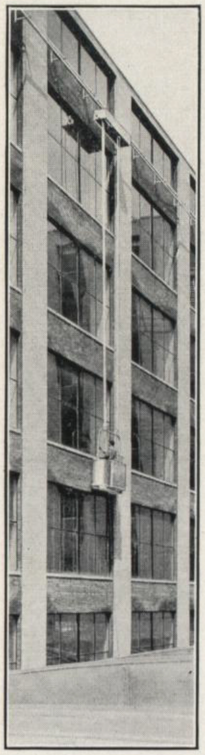


Fig. 162B

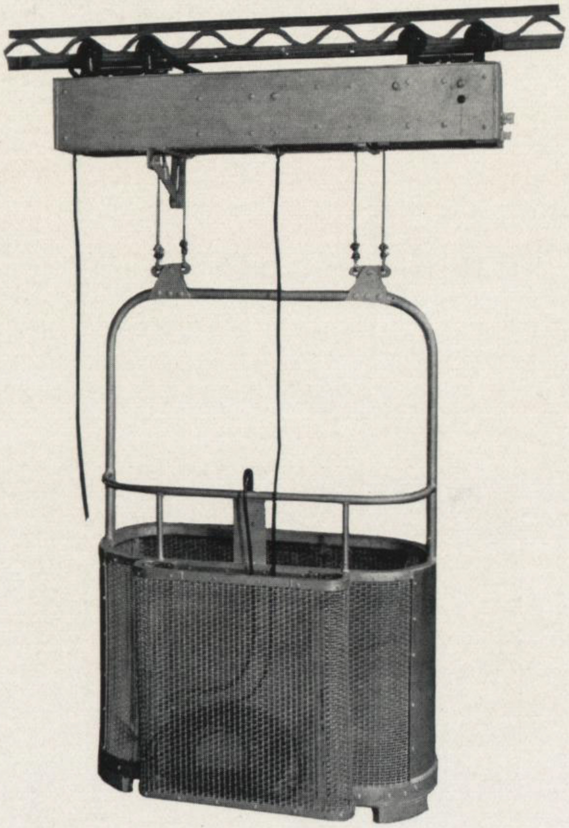


Fig. 162A

The outside cleaning of windows in the modern multi-story factory or administration building with its large areas of glass becomes a matter of considerable expense. There is also an element of danger for workmen, who may not be careful always to use safety belts and hooks.

To reduce this necessary cost and provide a safe means of handling men and cleaning materials we have designed and built the Window Cleaning Equipment shown here.

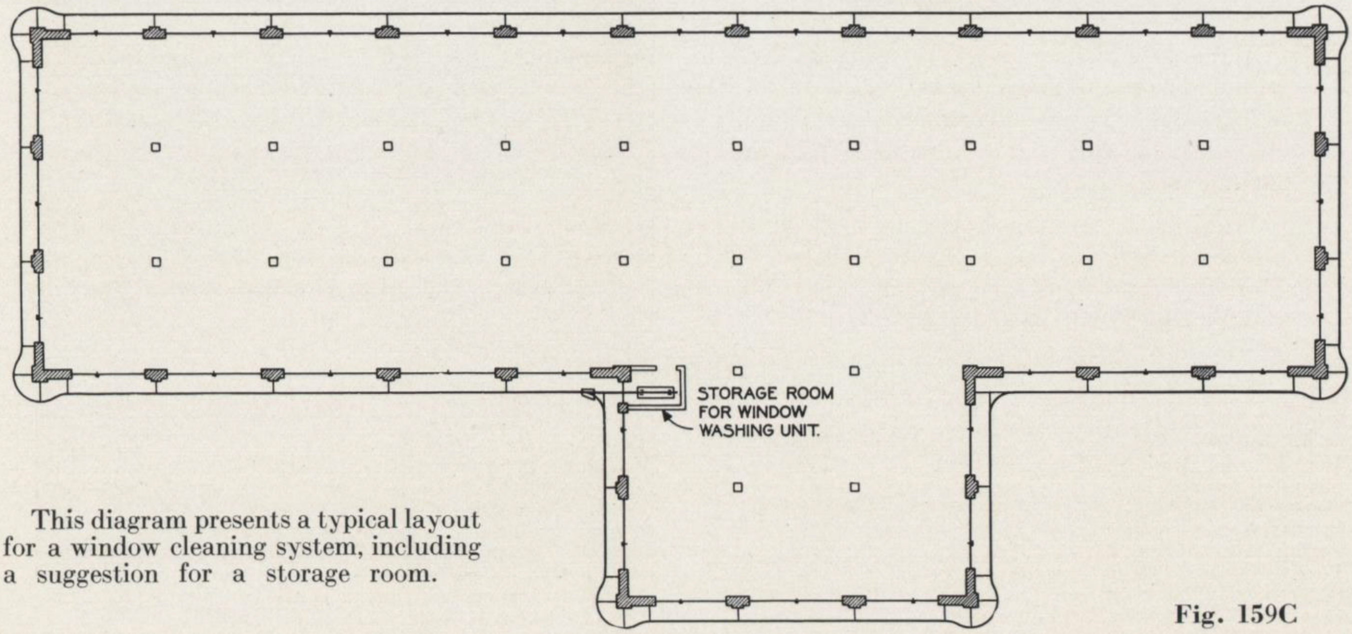
The Window Cleaning Unit consists of MonoRail runway carried at the top of the building. The method of suspension, usually by means of brackets, depends on the character of the building.

On this runway are mounted two MonoRail trolleys carrying an electric hoist in a weather-proof housing. The cage is amply proportioned for the free working movements of two men, and the necessary cleaning equipment.

The electric hoist relieves the men of the extra labor of raising and lowering the cage and greatly speeds up the whole operation. Ample safeguards are provided at all points in the hoisting and carrying members. The cage is man-safe, light, and easily moved from point to point. Hand-operated lifting mechanisms are furnished for buildings only three or four stories high but are impractical for tall buildings where time and effort of lifting men and equipment require the use of an electric hoist.

Other uses will be found for a unit of this kind such as washing the exterior of tiled buildings, making repairs, or painting exterior wood or metal work.

Correspondence is invited. No two installations are identical, and we shall welcome an opportunity to make recommendations.



This diagram presents a typical layout for a window cleaning system, including a suggestion for a storage room.

Fig. 159C

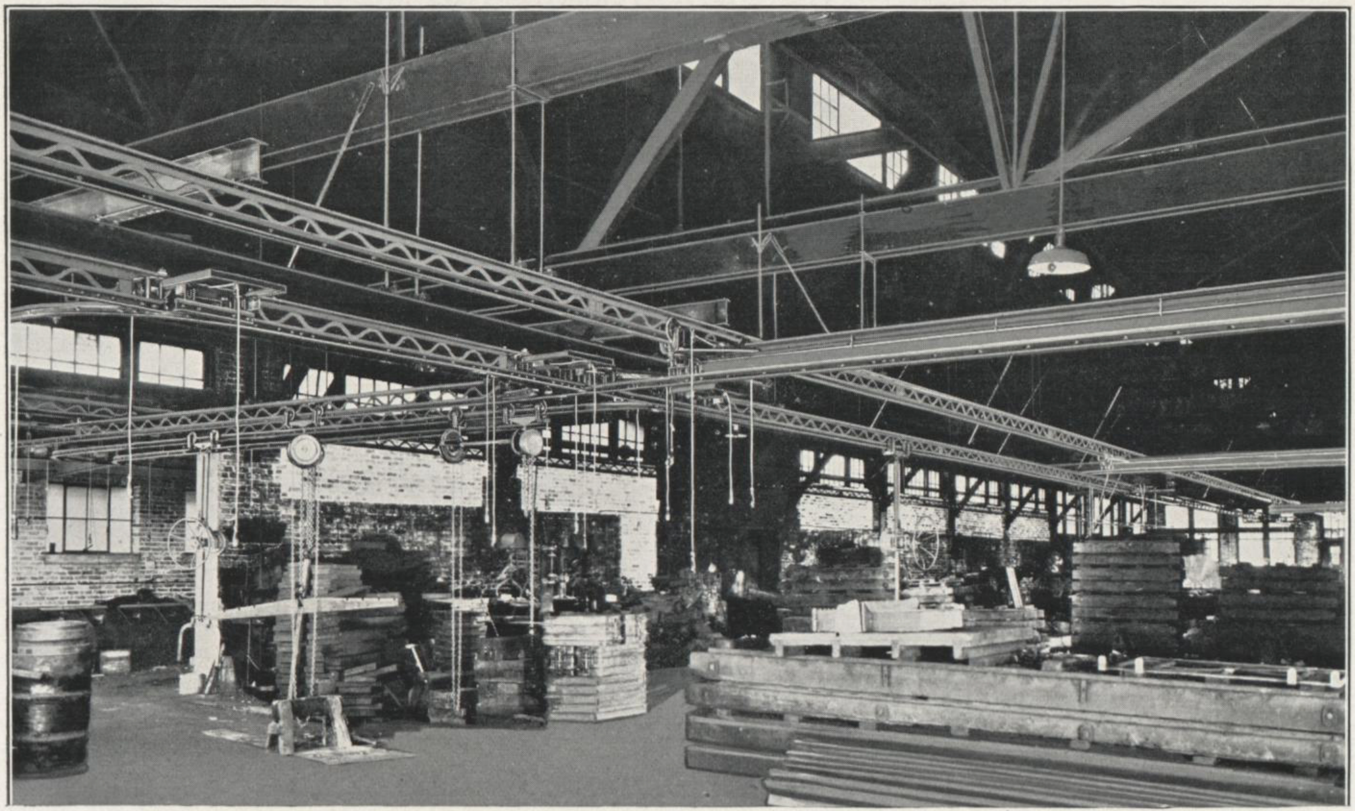


Fig. 163 *MonoRail in the plant of the Coleman Bronze Company, Chicago. A clean-cut, efficient installation making extensive use of Truss Rail as runway for cranes and trolleys.*

Engineering and Data Section

The following pages contain information essential in laying out a MonoRail System. This information supplements the descriptive matter and data given with various items in the catalog section and which could not for lack of space be included there.

Methods of picking up and carrying materials are important, and many suggestions are offered in the section devoted to grabs, racks and carriers. The method varies with each material and grade or type of material. MonoRail engineers are in daily contact with handling problems of widely varying character and can render valuable help in working out the specific problem in co-operation with the manufacturer.

Problems of layout, however, are more general and are no less important. To assist in meeting these problems there are many drawings showing what has been, and what may be done with American MonoRail, and there are pertinent suggestions and facts governing the arrangement of a MonoRail system which will be helpful.

Subjects

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Outline Of MonoRail Handling

GENERAL CONSIDERATIONS

1:—SAVINGS POSSIBILITIES:

- a. Internal Plant Handling, placing and transportation is 5% to 85% with an average of 25% of product cost.

2:—FLEXIBILITY

- a. Interlocking system compising MonoRail Lines, Switches, Turntables, Cranes, Transfers and Jibs, Inter-Floor Lifts, Hoists, Lifting & Dipping Machines, MonoRail Scales, Counters and Batchers, Trolley Pushers, Chain Drives, Gravity Lines.
- b. Intricate Flow Plans for Materials in Process. Fig. 42A, Fig. 44A, Fig. 142B.
  Cross Handling. Fig. 74A, Fig. 95A, Fig. 142B. "Cushion" Storages. Fig. 40A, Fig. 44B, Fig. 150A. Testing and Inspection "Set Outs". Fig. 74B. By-Passing. Fig. 38A, Fig. 42A, Fig. 71B, Fig. 54A. Single or multiple unit groupings. Fig. 67A, Fig. 74A.
- c. Overhead Reduces Interferences. Over Congested Aisles and Floor Piles. Fig. 38A, Fig. 40B. Across Machines, vats, storage areas. Fig. 92D, Fig. 151C. Unfloored spaces. Fig. 32A. Above mud, snow, ice & debris. Fig. 13B, Fig. 109B, Fig. 163A.

3:—ASSEMBLY CONVENIENCES

- a. Routing and Spotting. Fig. 40A, Fig. 147D, Fig. 151C.
- b. Pace setting. Fig. 71B.
- c. Moving Assembly. Fig. 132A, Fig. 154B. Passing along hand-to-hand. Fig. 133A, Fig. 142B. Boosters and Chain Drive. Fig. 155A.
- d. Suspended holders, racks, jigs, frames, turnovers, hooks, grabs or containers. Fig. 7A, Fig. 50B, Fig. 77B, Fig. 126A, Fig. 142A.

LABOR ECONOMIES

1:—FATIGUE ELIMINATION

- a. Continuous effort, pushing—lifting. Fig. 157B.
- b. Straining tasks. Fig. 6A, Fig. 30B.
- c. Work at inconvenient or improper height. Fig. 146B.

2:—INCREASED MAN TONS:

- a. MonoRail tractive resistance averages under 2% starting, 1% moving.
- b. Moving loads in trolley "trains". Fig. 23B.
- c. Moving loads in large racks or bulk material containers. Fig. 151A.

3:—AUTOMATIC TRANSPORTATION

- a. Boosters and feeders. Fig. 156C, Fig. 157A.
- b. Gravity and Booster combinations.
- c. Automatic lifting and Discharging Machines. Fig. 133A.
- d. Chain Driven trolleys. Fig. 154A.

4:—MAN POWER REDUCTIONS

- a. Assembly or testing en route. Fig. 147C.
- b. Elimination of "Gangs" and "Extras". Fig. 81A.
- c. Elimination of "Borrowing" help. Fig. 36B.
- d. Increasing load sizes. Fig. 36A.

5:—ELIMINATING HANDLING

- a. Placing product directly on rack or carrier for processing or storing. Fig. 32B, Fig. 56A.
- b. Picking material directly from truck, car or machine. Fig. 117B.
- c. Placing direct from carrier without rehandling. Fig. 132A.

SAFETY

1:—TO MEN

- a. Elimination of straining and lifting. Fig. 33B, Fig. 147A.
- b. Relief from slipping and stumbling with loads. Fig. 124B.
- c. Prevention of mashing fingers and legs. Fig. 146D.

2:—TO MATERIALS

- a. Bumping, scarring, jamming, falling. Fig. 53B, Fig. 94A, Fig. 147B.
- b. Clearances fixed by rail location. Fig. 40A, Fig. 36A.
- c. Carried out of way of traffic. Fig. 148B.

3:—TO BUILDING

- a. Removes cutting and grinding floor wear. Fig. 40A, Fig. 67A. Fig. 74A.
- b. Overhead carriers at machines to prevent chipping and bruising where materials are thrown on floor.
- c. Walls and door jambs protected due to clearances maintained by MonoRail. Fig. 36A, Fig. 40A, Fig. 55C.

SPACE SAVINGS

1:—MANUFACTURING FLOOR SPACE

- a. Handling over-head aisle elimination. Fig. 92D, Fig. 151C.
- b. Space saving around machines. Fig. 147D.
- c. Piling and Storage space elimination. Fig. 55A.

2:—STORAGE FLOOR SPACE

- a. Aisles reduced or eliminated by "up and over" handling. Fig. 146B, Fig. 147D.
- b. High Piling. Fig. 36B, Fig. 148C.

3:—INTERBUILDING TRAFFIC HIGHWAY SPACES

- a. Directly between building at higher floor levels avoiding elevators and detours.

Layout Information

Possible interference with machinery, piping, conduits, air ducts, down spouts, line shaft, belting, knee braces, column caps, door lintels, fire doors, low beams or arches should be noted at the time measurements are made for the track layout. Clearances should be checked along the entire line to see that the loads carried will pass without striking, particularly on curves or near columns. A building plan furnished for making a layout should give the location, size and height of all supporting beams or lower chords of trusses. Attention to this will avoid errors in layout, as well as delays and possible expense.

Measurements to columns and column lines should be given to the center line of the columns or if made otherwise it should be so indicated. This is especially important where bulky packages are to be handled.

The height of the MonoRail above the floor should be given. Where there is a variation in floor level, or where the rail is to be suspended under a sloping roof, this should be noted.

The weight of the maximum load with the number and kind of trolleys should be given so that the maximum total load and its distribution in any one span can be determined.

Below is shown a composite building in which various types of building construction and possible interferences are indicated as a guide for checking a layout as to supports and clearances.

See "Measuring Up a MonoRail Layout" on the following page.

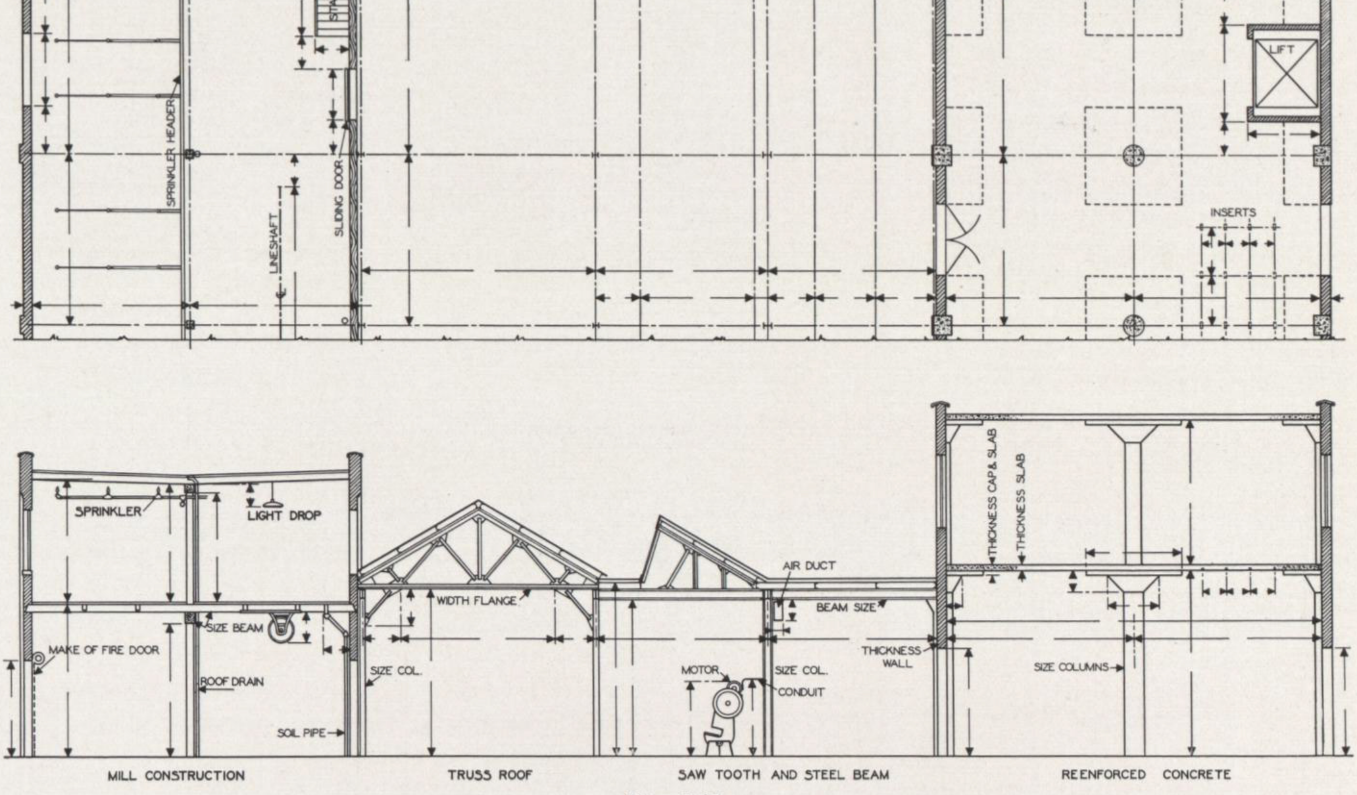


Fig. 165

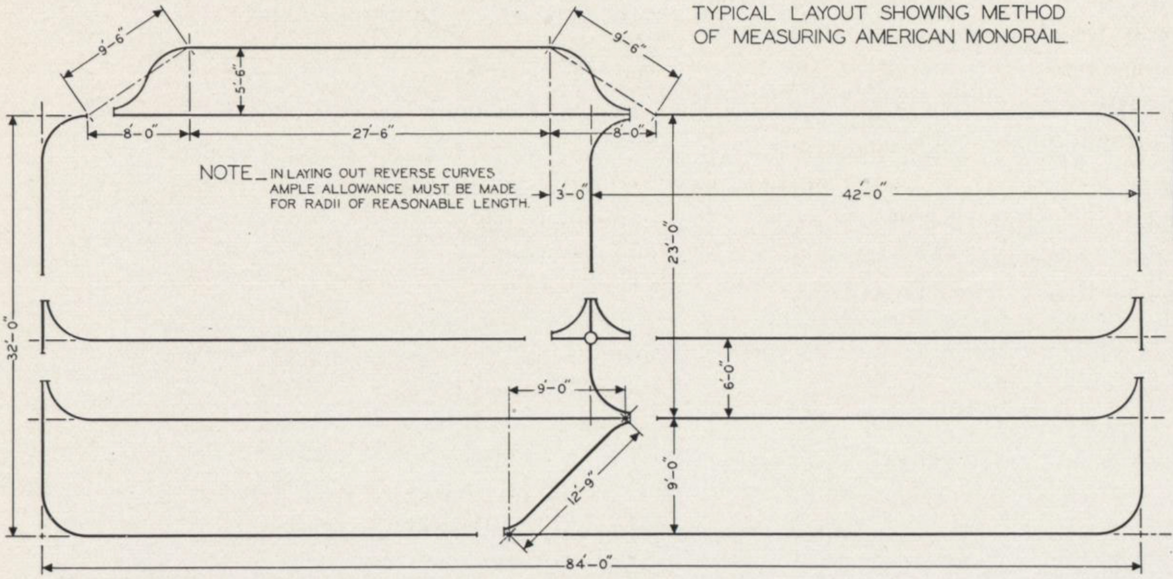
Measuring Up a MonoRail Layout

Below is shown a simple layout. Measurement of each line should be made to the intersection of the straight lines without regard to curves, and through switches without deduction for the moving section of switch rail. This will take care of the cutting waste.

The layout gives all dimensions necessary to fabricate the equipment in our plant. Curves are supplied in accordance with our standard practice wherever they can be used.

Fabricating a MonoRail System out of stock rail lengths causes cutting waste which is a minimum with American MonoRail due to the variety of lengths carried in stock.

TYPICAL LAYOUT SHOWING METHOD OF MEASURING AMERICAN MONORAIL.



NOTE—IN LAYING OUT REVERSE CURVES AMPLE ALLOWANCE MUST BE MADE FOR RADII OF REASONABLE LENGTH.

METHOD OF FIGURING
4 X 84 = 336-0
2 X 32 = 64-0
1 X 23 = 23-0
1 X 27-6 = 27-6
2 X 9-6 = 19-0
1 X 12-9 = 12-9
TOTAL = 482-3

MEASUREMENTS COVER FITTING LOSSES DUE TO FABRICATION FROM STOCK RAIL LENGTHS

Fig. 166A

Rack Clearances

When trolleys on a rack are placed close together allowing considerable overhang at the ends, more rack clearance is required on the outside of the curve in a MonoRail layout. When trolleys are placed near the ends of the rack, it increases the clearance requirement on the inside of the curve. These two conditions are illustrated graphically in the drawing at the right.

It may also be noted that when the trolleys are closer together the stress is increased in the top beam of the rack. Usually trolleys may be placed about one-fifth or one-sixth of the length of the rack from the end.

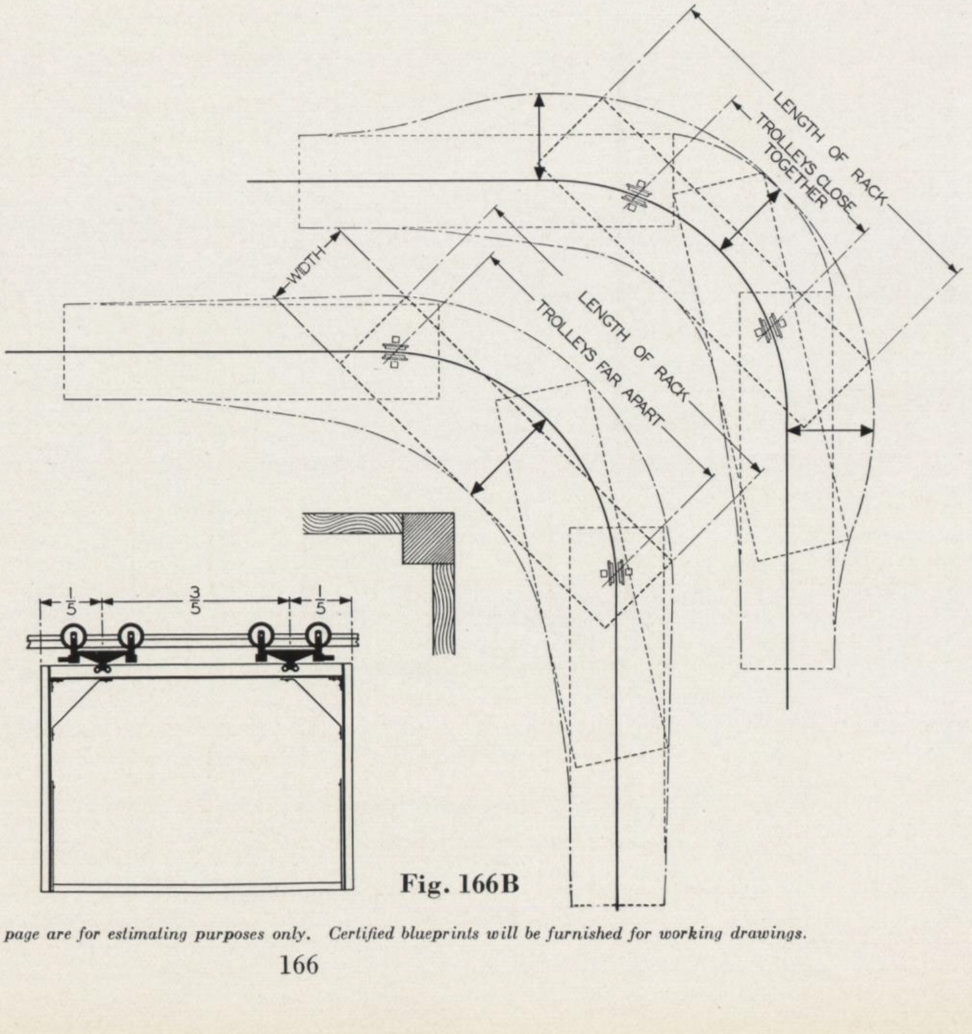
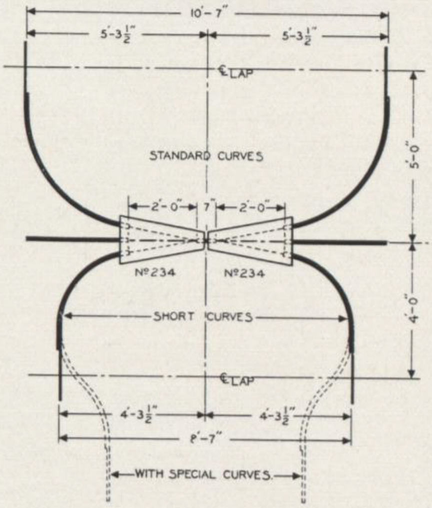
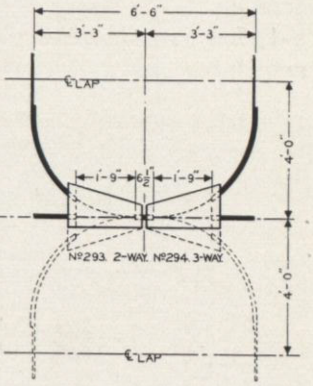


Fig. 166B

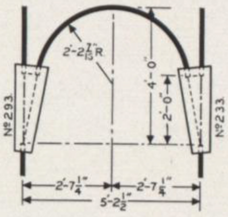
Layout of Switches and Minimum Clearances

The question often arises in making layouts as to how closely together switches may be placed in various relations to each other. These clearances have been worked out for most of the possible combinations of both tongue and glide type switches. Minimum dimensions and switch clearances are shown which must not be decreased. This will avoid interference of switch plates, safeties, shift sections, and guards.

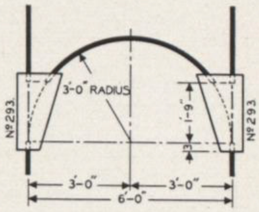




CURVES WITH GLIDE TYPE SWITCH.

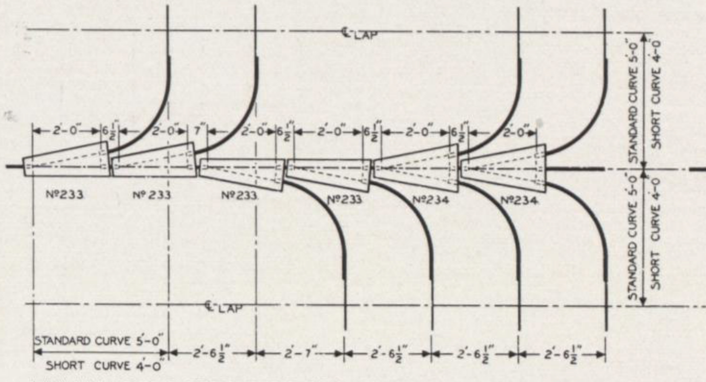


MINIMUM WITH TONGUE TYPE SWITCHES. WITH COLD BENT CURVE.

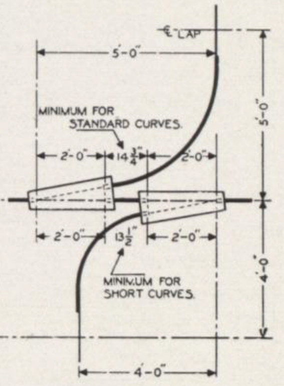


MINIMUM WITH GLIDE TYPE SWITCHES. STANDARD RADIUS.

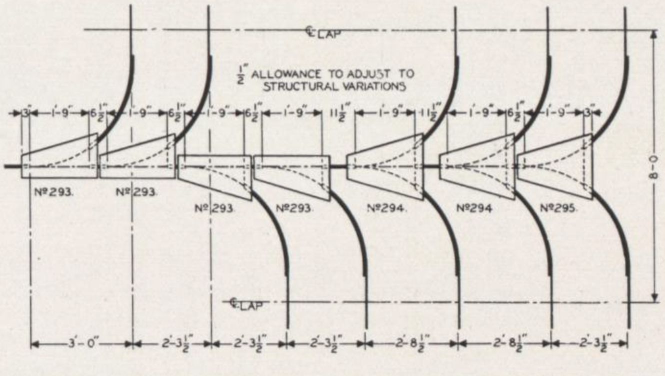
Fig. 167A

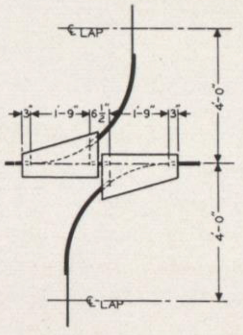


MINIMUM SPACING OF TONGUE TYPE SWITCHES FOR DIFFERENT ARRANGEMENTS.



MINIMUM SPACING WITH STOCK CURVES FOR TWO Nº233 SWITCHES FACED TOGETHER.





MINIMUM SPACING OF TWO GLIDE TYPE SWITCHES Nº293 FACED TOGETHER.

Fig. 167B

MINIMUM SPACING OF GLIDE TYPE SWITCHES FOR DIFFERENT ARRANGEMENTS.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Hanger Suspensions

Below are shown typical methods of suspension employing most of the standard types of clamps, brackets, buckles and supports with a few of the essential measurements useful in preliminary details.

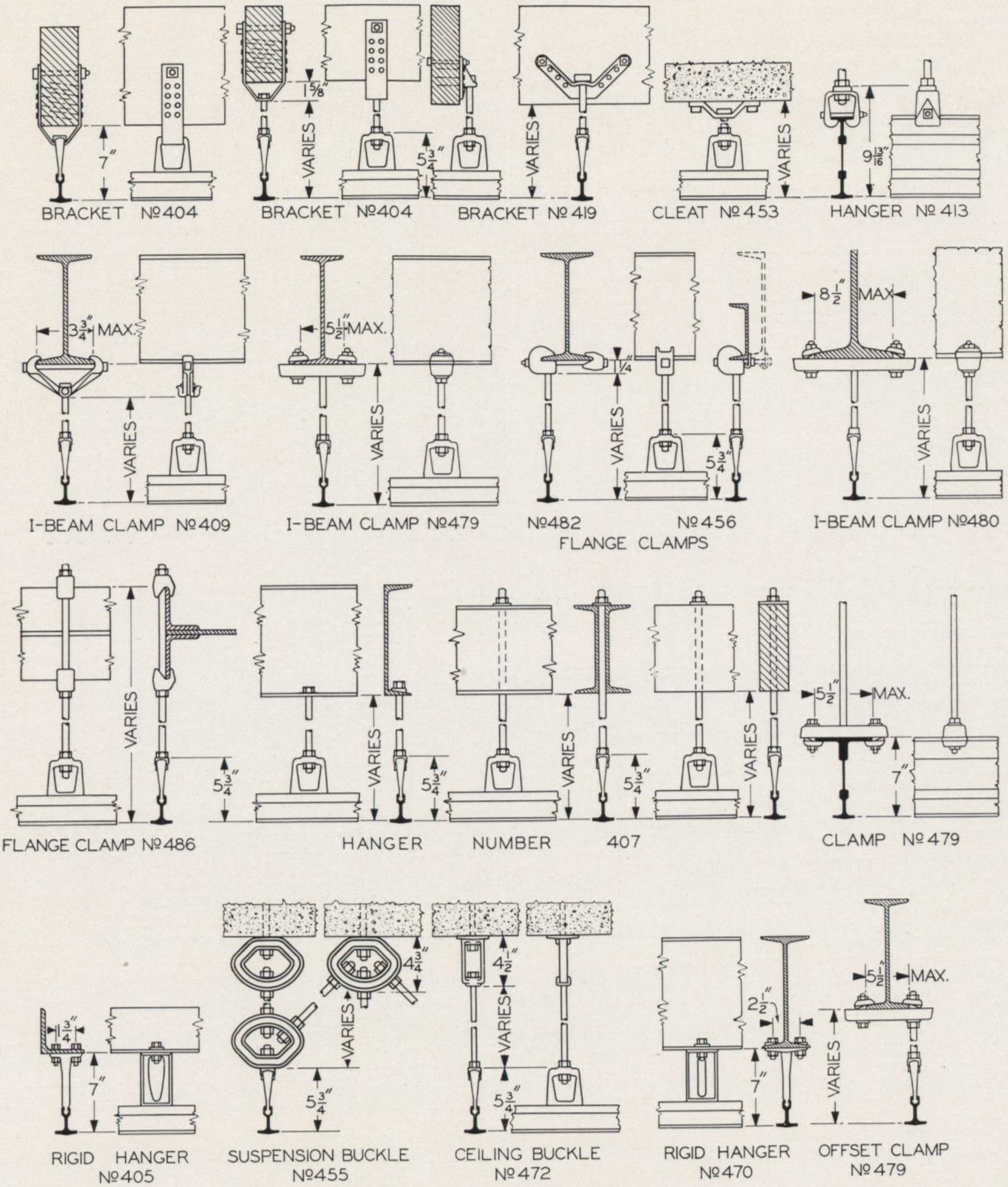


Fig. 168

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Details

Detail dimensions and detail information is given below on various items in addition to the illustrations and descriptive matter given on pages 28 and 29.

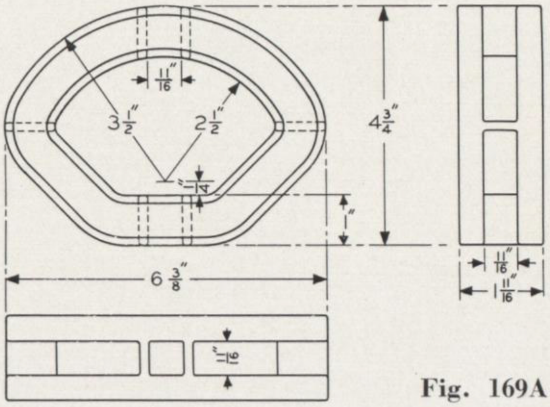


Fig. 169A

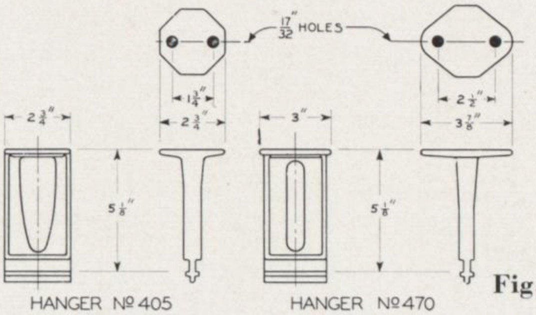


Fig. 169B

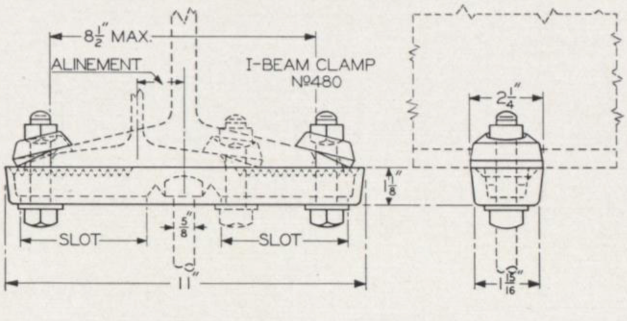


Fig. 169C

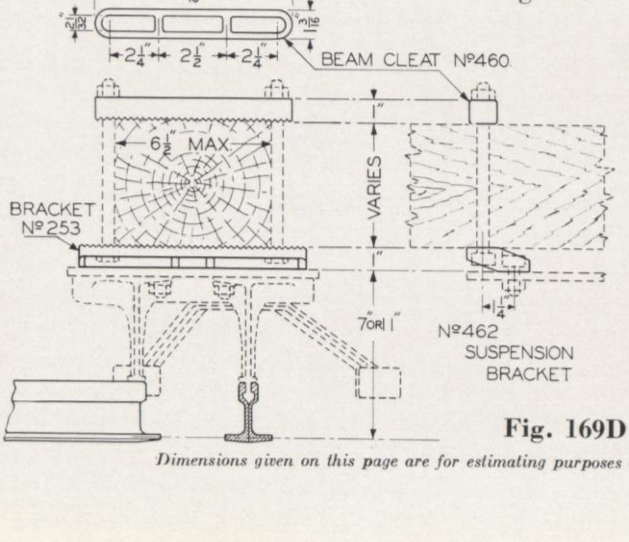


Fig. 169D

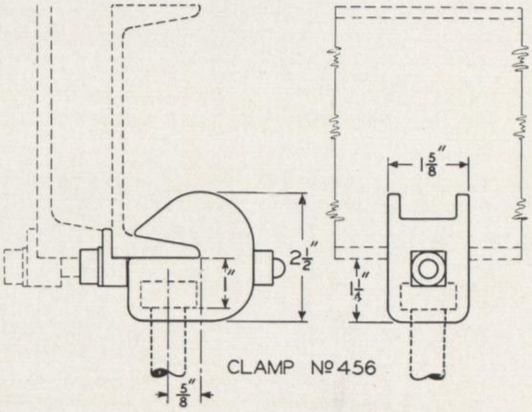


Fig. 169E

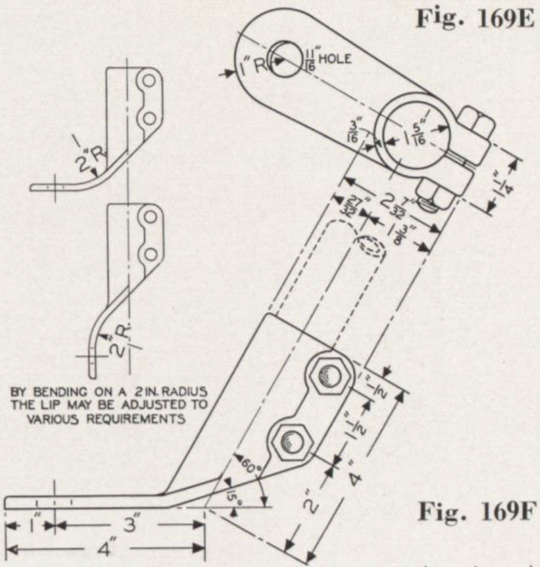


Fig. 169F

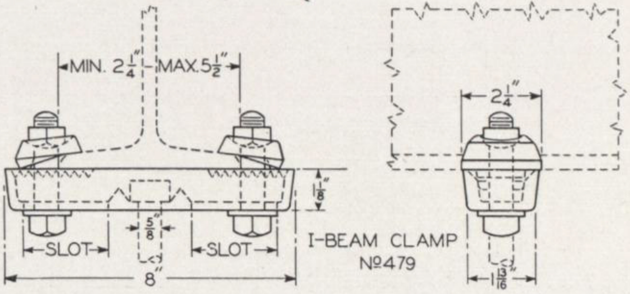


Fig. 169G

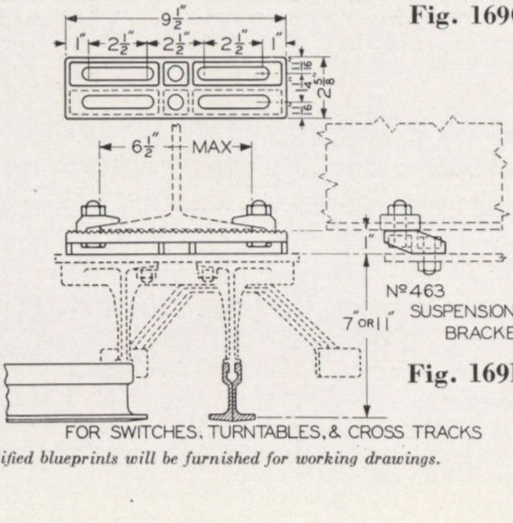


Fig. 169H

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Crane Data

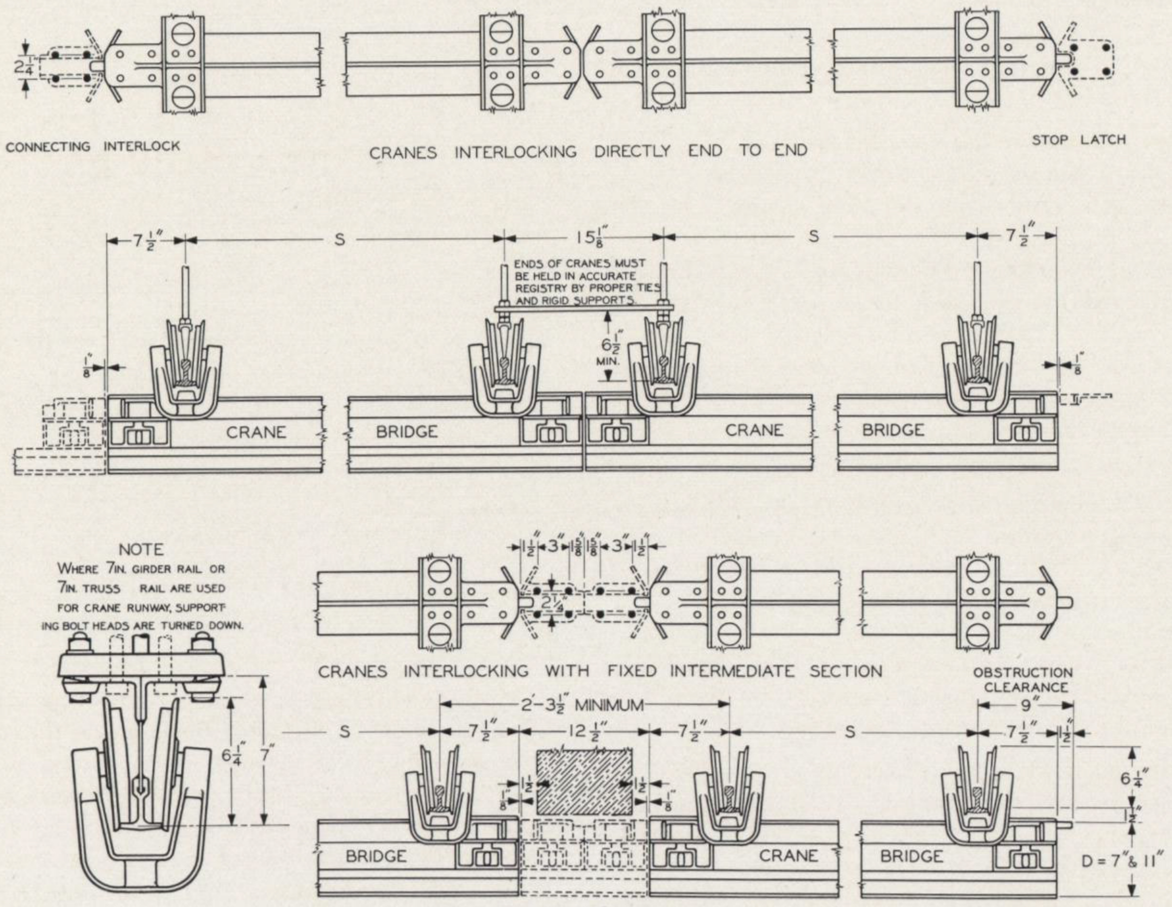

2¼"
CONNECTING INTERLOCK
CRANES INTERLOCKING DIRECTLY END TO END
STOP LATCH
7½"
S
15⅛"
S
7½"
ENDS OF CRANES MUST BE HELD IN ACCURATE REGISTRY BY PROPER TIES AND RIGID SUPPORTS.
6½" MIN.
⅛"
⅛"
CRANE
BRIDGE
CRANE
BRIDGE
NOTE
WHERE 7IN. GIRDER RAIL OR 7IN. TRUSS RAIL ARE USED FOR CRANE RUNWAY, SUPPORTING BOLT HEADS ARE TURNED DOWN.
6¼"
7"
1½" 3" ⅛" ⅛" 3" 1½"
2¼"
CRANES INTERLOCKING WITH FIXED INTERMEDIATE SECTION
OBSTRUCTION CLEARANCE
2'-3½" MINIMUM
9"
S
7½"
12½"
7½"
S
7½"
½"
½"
½"
⅛"
⅛"
6¼"
½"
BRIDGE
CRANE
BRIDGE
D = 7" & 11"

Fig. 170A—Clearances

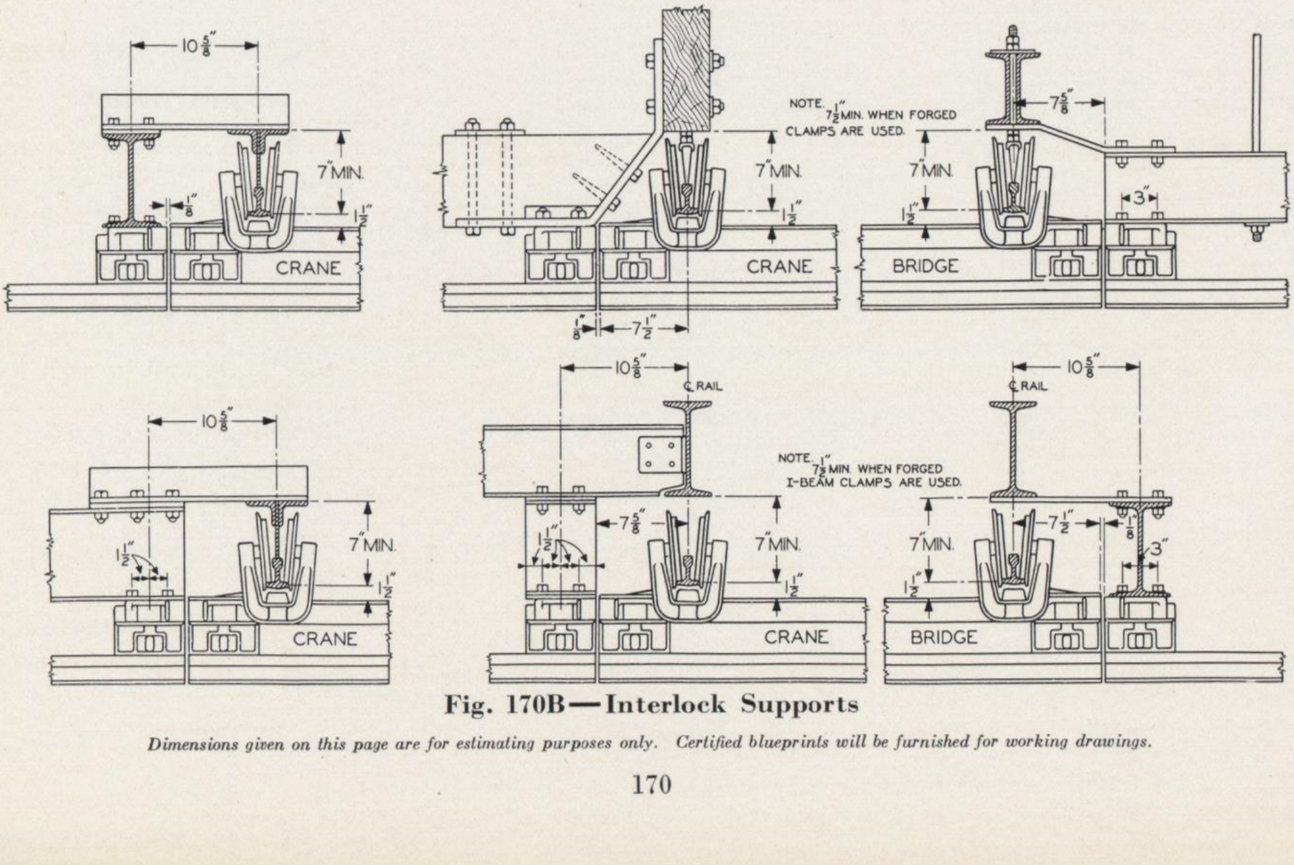


Fig. 170B—Interlock Supports

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Crane Data (Continued)

General information on standard cranes is given on pages 95 to 101.

Where standard rail is used for crane runways and where headroom is not a factor, the same electrification on the crane runways as is standard for rail electrification may be used. In such cases the conductors and insulators must be raised 1″ above the top of the forged hangers to clear the larger diameter crane wheels. This is accomplished by using a jam nut and lock washer on top of the No. 407 hanger and another jam nut under the insulators. The methods of attaching the collectors to the end trucks of cranes are shown in the drawing at the right.

Minimum clearances for cranes interlocking directly with each other are shown below and also the minimum length of a fixed section of MonoRail between two interlocking cranes. The end clearance for latch and safety bolts is also shown. When there is an increase in the overhang over the 7-½″ furnished with standard cranes, this increase must be taken into consideration when figuring clearances.

Several suggestions for supporting crane interlocks on connecting MonoRail are given at the bottom of the opposite page. It is necessary that a rigid connection be made between the crane interlock and the crane runway rail. This will maintain the proper relation of interlock and crane end and prevent interference or too wide end clearance. It also prevents either the interlock or crane end from deflecting independently of each as a capacity load approaches the break in the rail between the crane and connecting track.

Some side thrust occurs on connecting interlocks when the crane latch bolt is thrown into the interlock as a moving crane passes. Some lateral deflection is allowable and side bracing is unnecessary with the framing shown. The end of the crane latch bolt is rounded so it will not latch into the interlock when the crane is moving rapidly. This is to prevent heavy side shocks to the interlock.

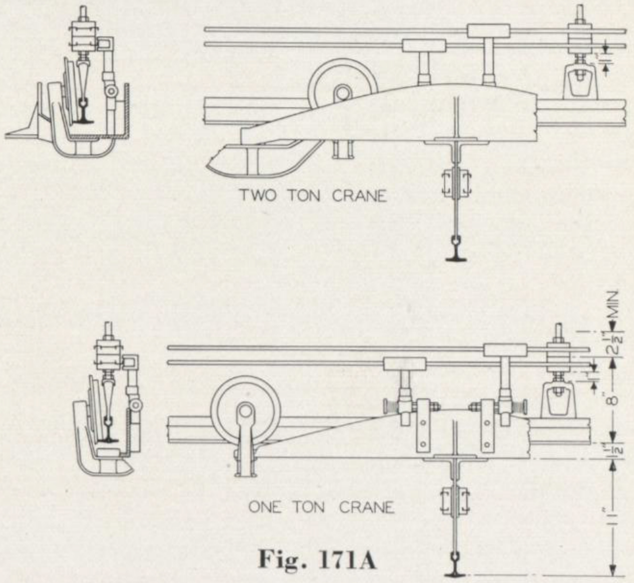


Fig. 171A

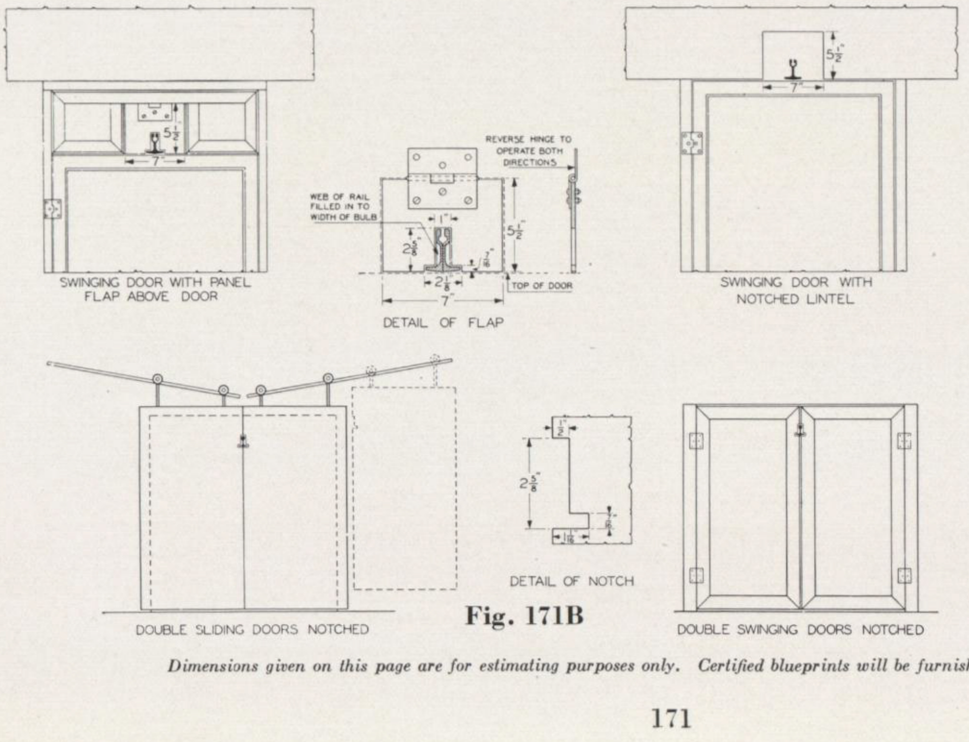

5½"
7"
SWINGING DOOR WITH PANEL FLAP ABOVE DOOR
REVERSE HINGE TO OPERATE BOTH DIRECTIONS
WEB OF RAIL FILLED IN TO WIDTH OF BULB
1"
2⅝"
5½"
7/16"
2⅛"
7"
TOP OF DOOR
DETAIL OF FLAP
5½"
7"
SWINGING DOOR WITH NOTCHED LINTEL
½"
2⅝"
⅞"
1⅛"
DETAIL OF NOTCH
DOUBLE SLIDING DOORS NOTCHED
DOUBLE SWINGING DOORS NOTCHED

Fig. 171B

Passing Through Doorways

Where MonoRail passes through door openings, the doors may often be arranged so that no break in the rail is necessary. Double doors whether hinged or sliding may be notched to the contour of the rail in each half of the meeting edges when the MonoRail is centered in the opening. Often it may be arranged to pass above a hinged type door through a notched panel. A small closure door with a hinge at the top and notched at the bottom to fit down over the rail section will prevent the loss of

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Passing Through Doorways (Continued)

heat or humidity in ovens, proofing rooms, dryers and the like.

One-piece sliding doors are commonly encountered in manufacturing, storage and commercial buildings. At times they occur on both sides of the wall. The standard type fire door track opener and methods of installation are shown on pages 51 and 52. Below is shown the method of installation for doors on both sides of the wall opening. Another method of installation of a single opener under the door lintel where headroom will permit, is shown at the right.

Swing out sections long enough to clear jackknife doors are also furnished when required.

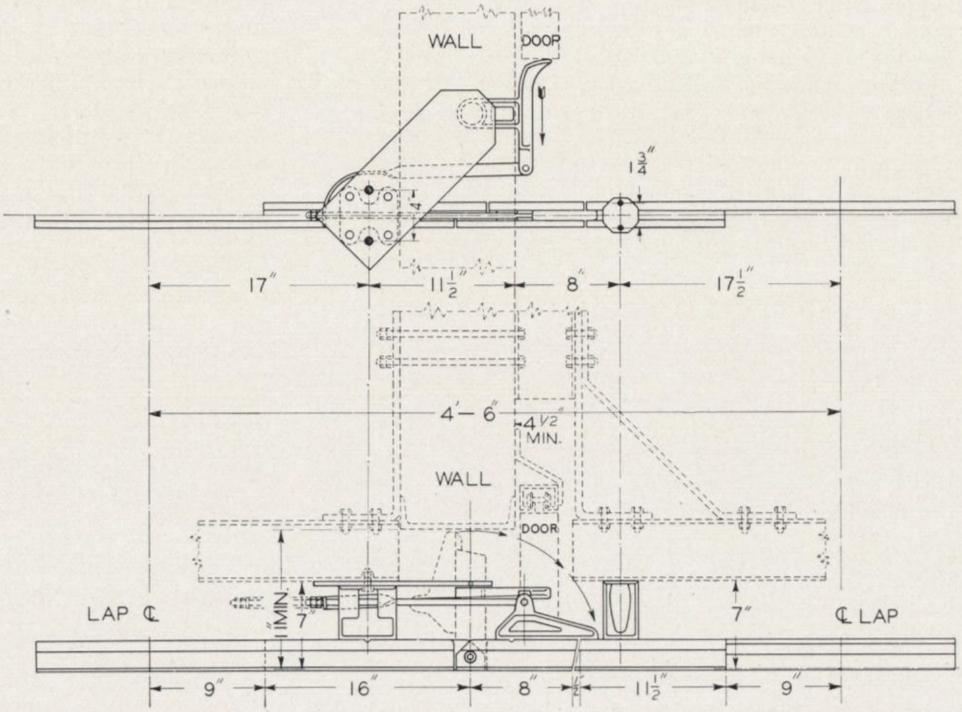


Fig. 172A

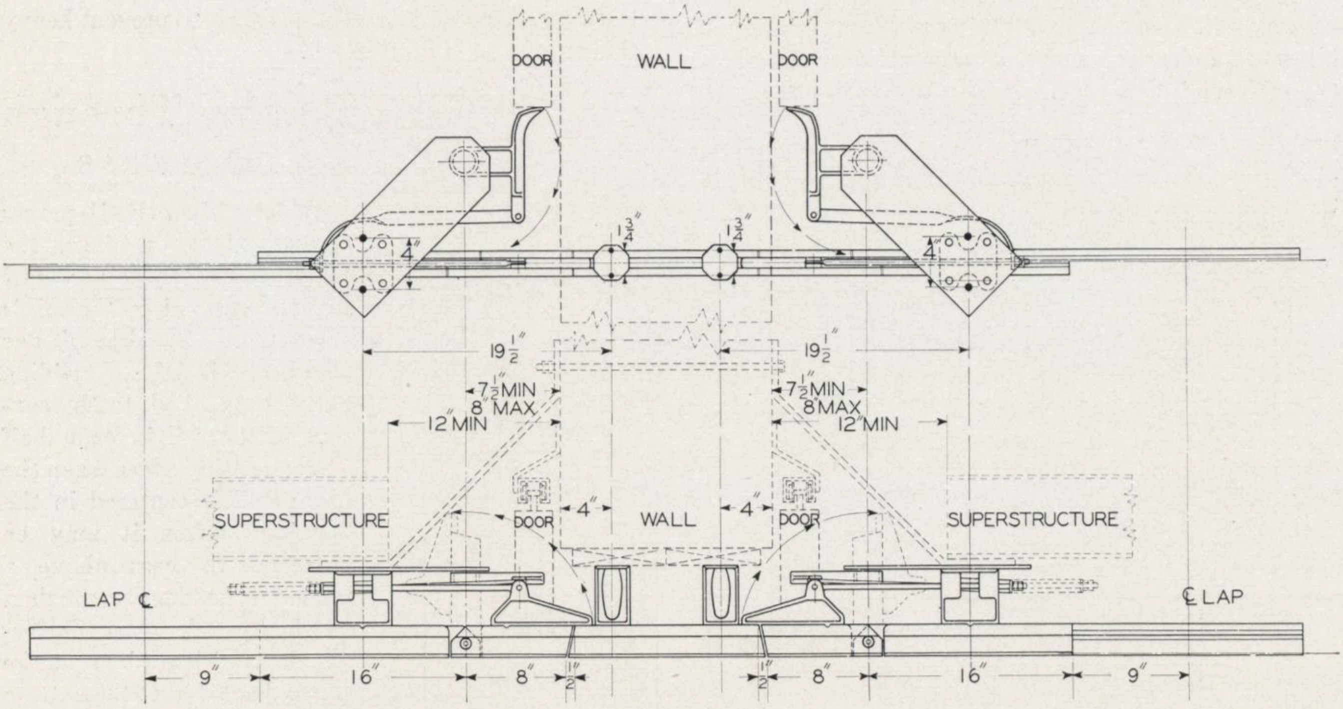


Fig. 172B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Trolley and Rack Storage

Storage space for racks and trolleys must be provided for in many plants. The most convenient and economical arrangement of the storage tracks is a problem which must be studied out in each individual case and only general suggestions can be offered here.

Factors entering into the problem are: the shape of area available, size of racks or trolley loads, location of main lines of MonoRail and of doorways, position of building beams and columns to be used for support, headroom available, aisle spaces required for handling, inspecting, classifying, or for serving machines. Clearance for protection against swing or possible damage to product, spacing for air circulation or processing, and other factors incidental to the problem under consideration must also be taken into account.

A composite rack or trolley storage area study is shown below. Storage areas served by different trackage arrangements are combined into a single drawing for comparative study with no effort to make a logical whole out of the layout, but to illustrate several typical methods, some of which may apply to any general rack or trolley storage problem.

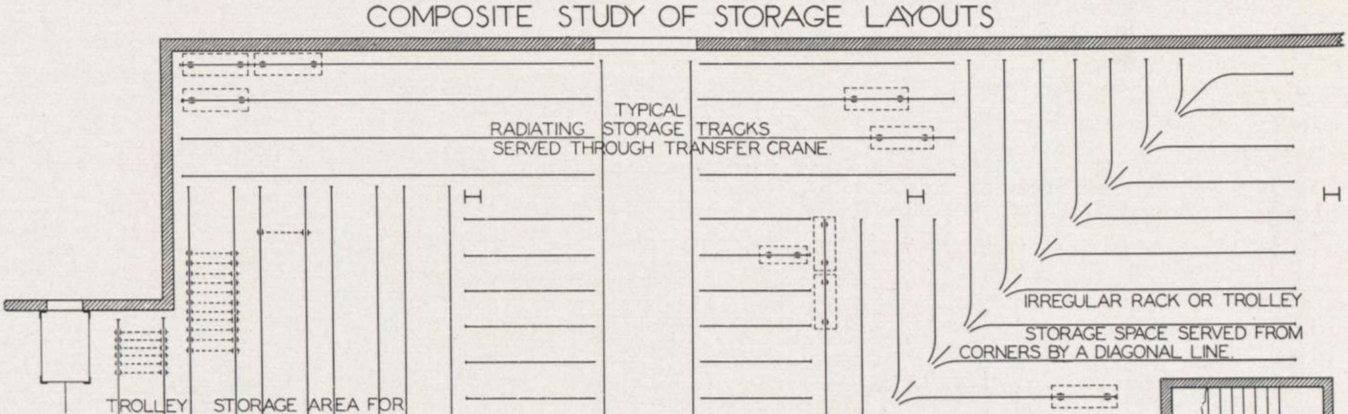

COMPOSITE STUDY OF STORAGE LAYOUTS
TYPICAL RADIATING STORAGE TRACKS SERVED THROUGH TRANSFER CRANE.
IRREGULAR RACK OR TROLLEY STORAGE SPACE SERVED FROM CORNERS BY A DIAGONAL LINE.
TROLLEY STORAGE AREA FOR NARROW RACKS CARRIED ON UNIFORMLY SPACED TROLLEYS ACROSS TWO TRACKS.
RACK STORAGE AREA LAID OUT BETWEEN TWO MAIN LINES FOR INSPECTION AND CLASSIFICATION OR READY ACCESSIBILITY.
CLOSELY SPACED RACKS CARRIED ACROSS TWO TRACKS IN PROCESSING ROOM.
DEAD END TROLLEY STORAGE
TYPICAL STORAGE LOOPS SERVED FROM SIDES OF SPACE.
LINES MAY BE SERVED FROM ONE SIDE ONLY WITH DEAD END AT OTHER.

Fig. 173A

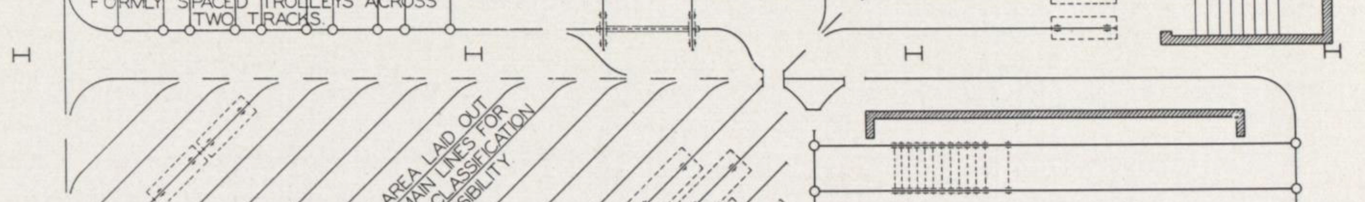


Fig. 173B

PROPER PLACING OF HANGERS

This drawing shows proper hanger spacing at the end of runs, at curves and switches. The proper spacing along straight runs for various combinations of loads and trolleys is shown on page 24.

Erection Drawing and Shop Fabricated MonoRail Systems

When full information is furnished with an order for MonoRail, the American MonoRail Company fabricates the system without extra charge. This eliminates the necessity of laying out curves and cutting and bending them on the job. The result is a considerable saving in time and erection expense. It also insures accurate forming and fitting of the curves. The method of measuring the rail is shown in Fig. 165, page 165.

With each fabricated American MonoRail system is furnished a layout plan showing the location by number of every piece of rail in the system. Corresponding numbers are painted on each rail section when they are fabricated in the shop. A typical layout with each rail section numbered is shown below. In this way the position of each rail section in the layout is definitely shown, effecting a very material saving in erection time and cost.

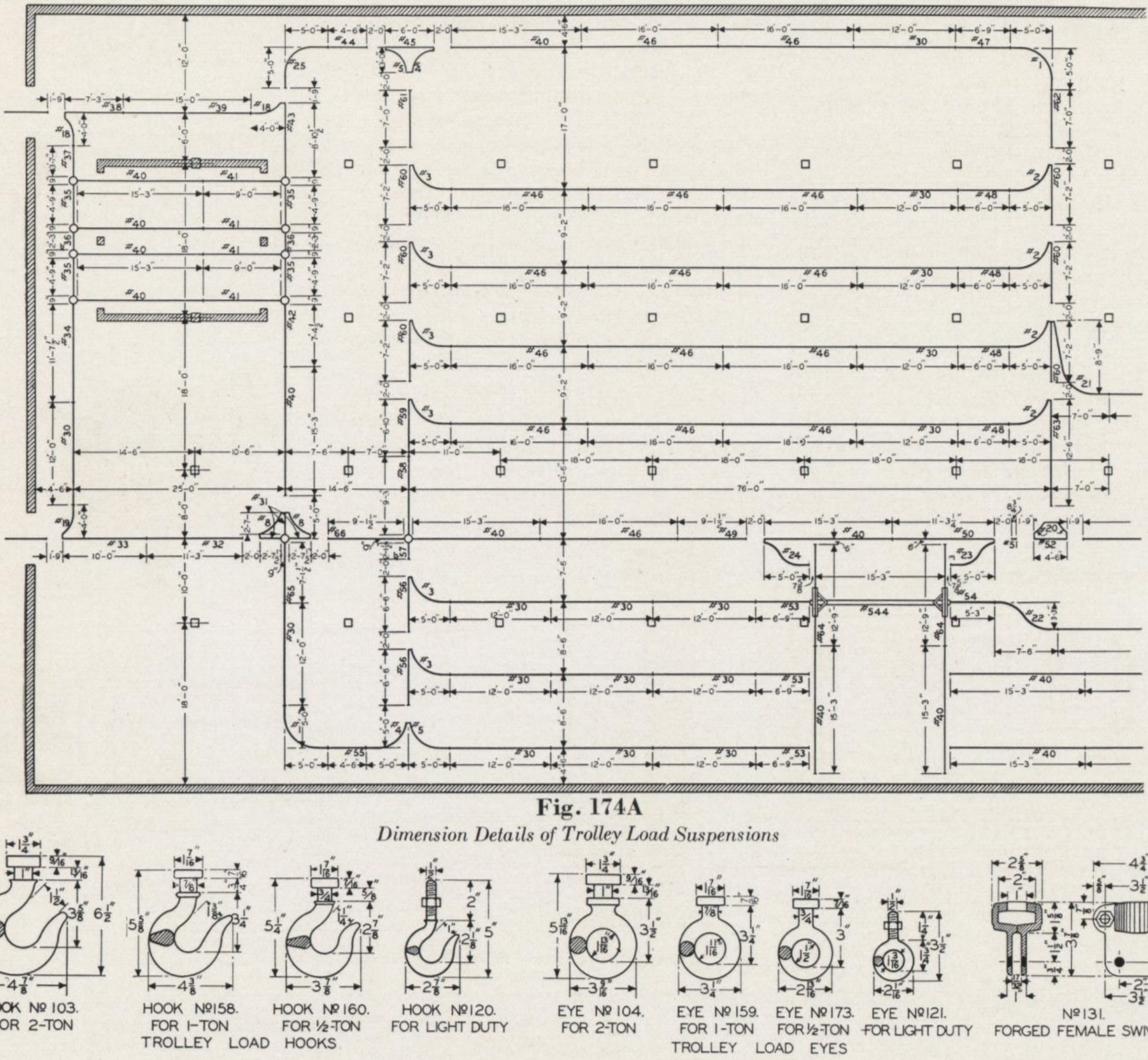


Fig. 174A

Dimension Details of Trolley Load Suspensions

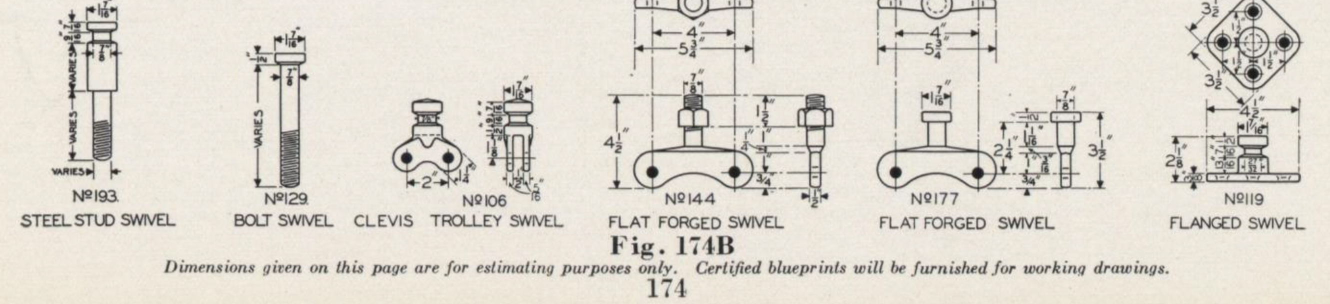


Fig. 174B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Attaching to Concrete

Through-bolts only should be used when supporting equipment from concrete or masonry ceilings or beams. Where there may be swaying or vibration in the supported equipment or structure, a flexible connection through a ceiling cleat, suspension buckle or similar flexible joint should be used.

When it is not possible to use through-bolts and is necessary to use expansion shields, the concrete or other material to which attachment is to be made should be examined to be sure it has sufficient strength to hold the shield. It is imperative that the hole drilled in the material be of the proper size for the shield and that the shield parts be properly assembled in the hole, and further that the expansion bolt be tightened sufficiently to expand the parts fully in the hole.

Use only an insert with sufficient plasticity in the expanding portions of the shield to make close contact with a large percentage of the interior hole surface and with enough strength in shear to prevent danger of shearing out. Shields having lead or hard, strong, fibrous expanding portions are recommended. The success of expansion shields depends upon the quality of the material in which it is placed, the care used in placing and the type of shield used. All three must be right. The use of two or more shields at each suspension point is urged.

When buildings are in the plan stage, the MonoRail layout should be completed and good inserts placed in the bottom of the floor slab to allow supporting directly to the ceiling below without superstructure. This will effect a considerable saving. The spacing of inserts depends upon the loads to be handled and items of equipment involved. Inserts are often shifted during construction operations and should allow for a few inches of lateral adjustment for aligning purposes. For this reason they should be placed at right angles to the centre line of the rail.

The American MonoRail Company will send insert layouts for any switch grouping. Their engineers will make insert layouts without charge for projects involving an overhead MonoRail system.

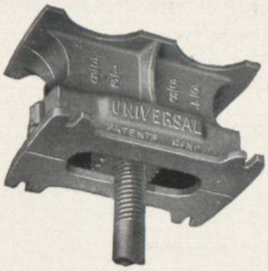


Fig. 175A

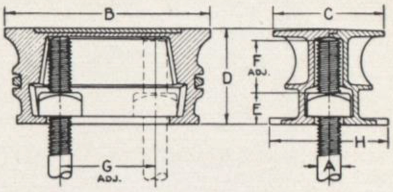


Fig. 175B

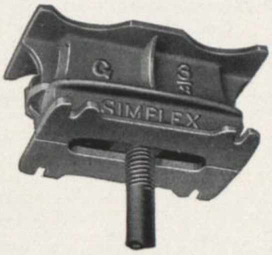


Fig. 175C

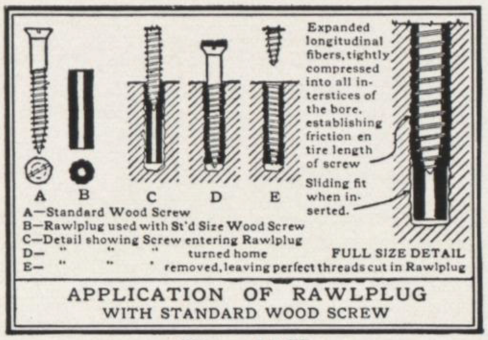

Expanded longitudinal fibers, tightly compressed into all interstices of the bore, establishing friction entire length of screw
Sliding fit when inserted.
A
B
C
D
E
A—Standard Wood Screw
B—Rawlplug used with St'd Size Wood Screw
C—Detail showing Screw entering Rawlplug
D— " " " turned home
E— " " " removed, leaving perfect threads cut in Rawlplug
FULL SIZE DETAIL
APPLICATION OF RAWLPLUG
WITH STANDARD WOOD SCREW

Fig. 175F

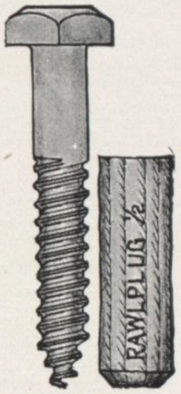


Fig. 175E

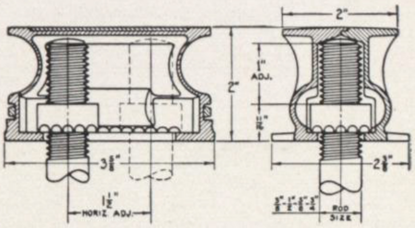


Fig. 175D

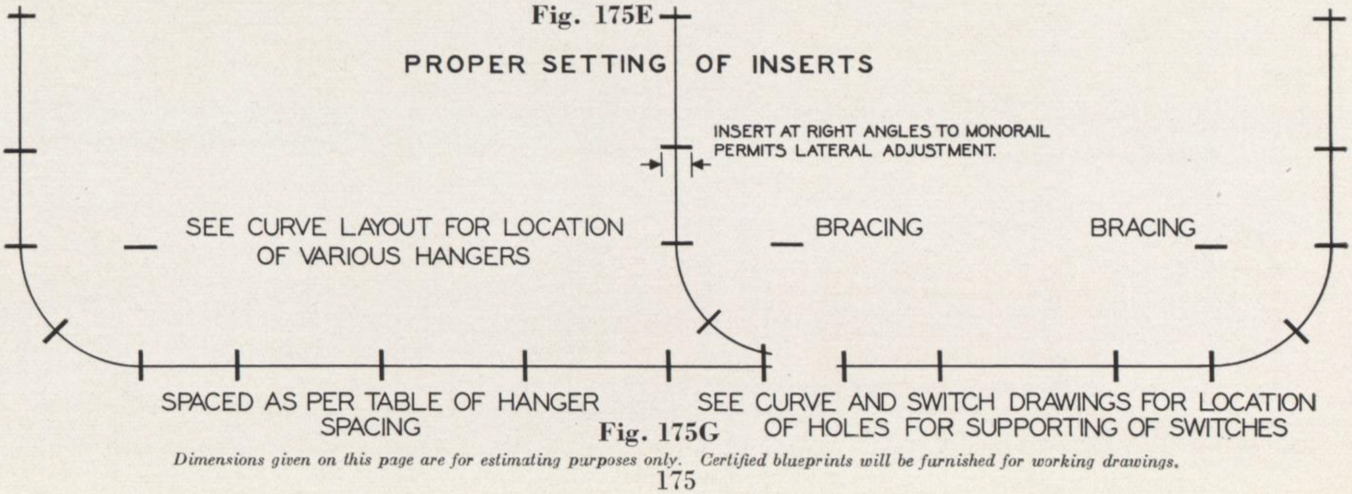

PROPER SETTING OF INSERTS
INSERT AT RIGHT ANGLES TO MONORAIL PERMITS LATERAL ADJUSTMENT.
SEE CURVE LAYOUT FOR LOCATION OF VARIOUS HANGERS
BRACING
BRACING
SPACED AS PER TABLE OF HANGER SPACING
SEE CURVE AND SWITCH DRAWINGS FOR LOCATION OF HOLES FOR SUPPORTING OF SWITCHES

Fig. 175G

Truss and Girder Rail

A general description of truss and girder rail with load tables is on pages 14 to 16. The following additional information will be useful in making layouts.

Truss and Girder rail are straight lengths with lap ends, square ends, and notched ends for attaching to switches, interlocks or turntables as shown below in all different assemblies, numbered for convenience in specification. Each depth is furnished in **standard and wide flange** sizes which are interchangeable. The wide flanged sizes are slightly stronger and especially adapted to longer spans.

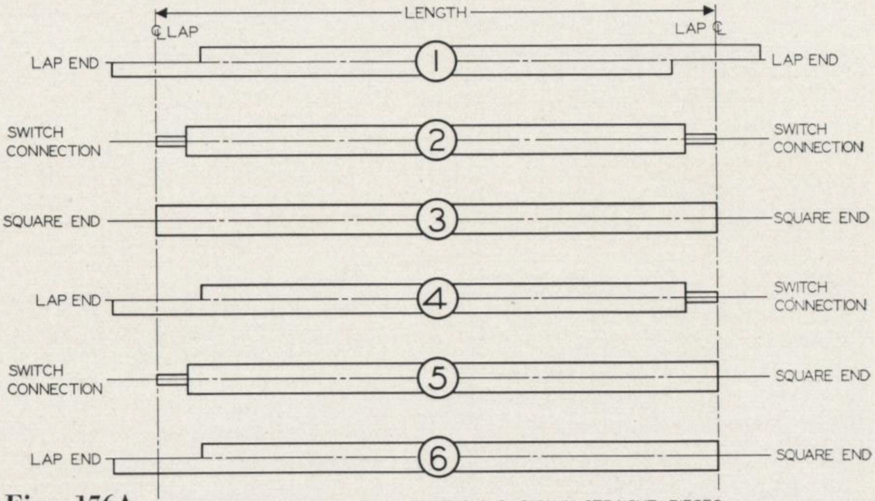


Fig. 176A FURNISHED IN STANDARD RAIL LENGTHS AND ONLY IN STRAIGHT PIECES

Considerable advantage may be gained in cases where the layout will allow continuous beam constructions with Truss or Girder rail as in crane runways. MonoRail engineers will advise without charge in such cases.

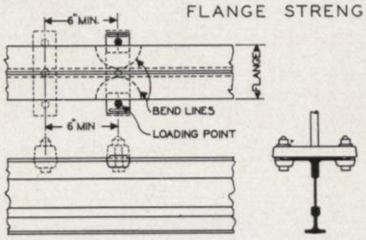
Lap splices give adequate support to connecting sections so that it is not neccessary to place the centre of the lap splice directly under the support. It may be moved as far away from the support as ⅛ of the spans. There should never be two splices in any one span. Care should be used in placing joints to avoid unnecessary cutting waste due to fractional lengths. Where Truss or Girder rail lengths are in fractions of feet, the charge is made for the next even foot length longer than the actual length of the piece. Measurement is made from the end of the piece on square cuts and to the centre of lap ends.

Clamp and Bolt Supports

The strength of the support where beams or rails are suspended from flange clamps may be governed by either the rod, the clamp or the strength of the beam flanges. When a single clamp connection is not strong enough, two may often be used. See Fig. 176B for typical connections.

FLANGE STRENGTH UNDER CLAMPS

FLANGE THICKNESS	MAXIMUM CLAMP LOAD
1/8"	700#
3/16"	1570
1/4"	2800
5/16"	4370
3/8"	6280

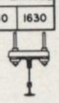


NOTE_USE TWO CLAMPS WHERE LOADS ARE GREATER THAN CAPACITIES SHOWN. PLACE CLAMPS 6IN. OR FURTHER APART.

CAPACITIES OF CLAMPS Nº 479, AND Nº 480. ON VARYING FLANGES

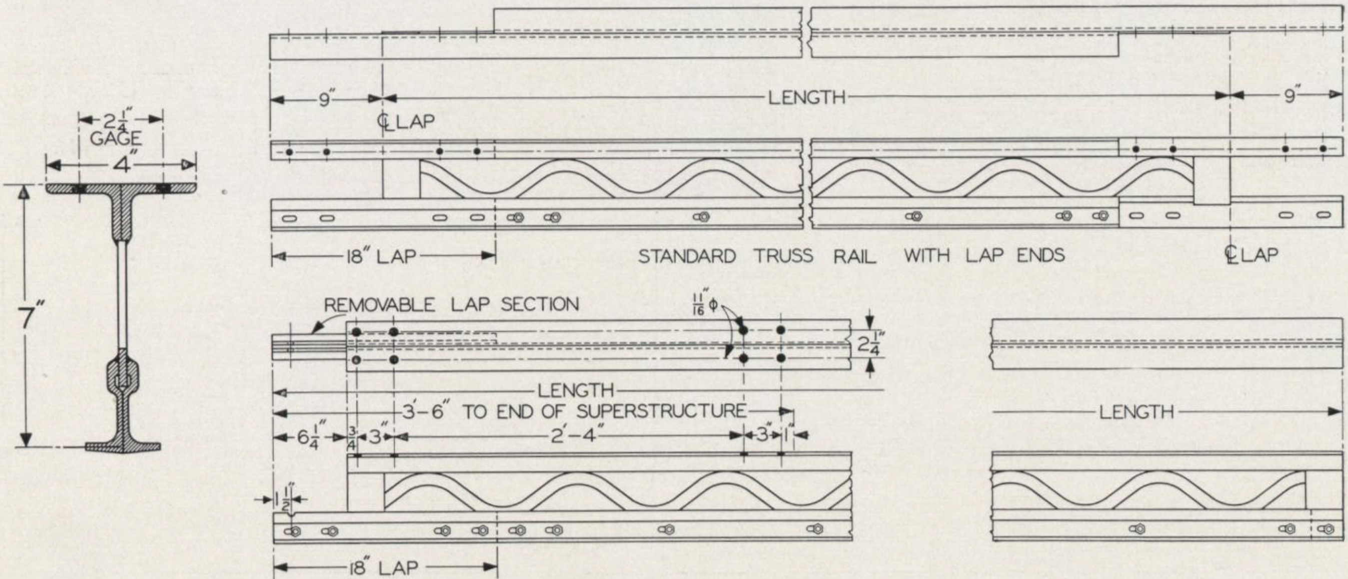
FLANGE WIDTH	3.33"	4"	5"	5½"	6"	6½"	7"	7½"	8"
479	3920	3110	2380	2130	WILL NOT TAKE THESE FLANGES				
480	4570	3630	2780	2480	2250	2050	1890	1750	1630

NOTE_WHEN HANGER ROD IS USED THROUGH CLIP THERE IS LITTLE STRESS IN THE CLAMP AND THE STRENGTH OF THE HOOKUP IS GOVERNED BY FLANGE OR BOLT



SIZE BOLTS	STRENGTH AT 1200# ROOT OF THREAD
1/2"	1520
5/8"	2420
3/4"	3620
7/8"	5040
1"	6600

Fig. 176B



STANDARD TRUSS RAIL WITH LAP ENDS

STANDARD CONNECTION FOR SWITCHES, INTERLOCKS, LIFTS, TURNTABLES, ECT.

STANDARD SQUARE END

Fig. 176C

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Truss and Girder Rail (Continued)

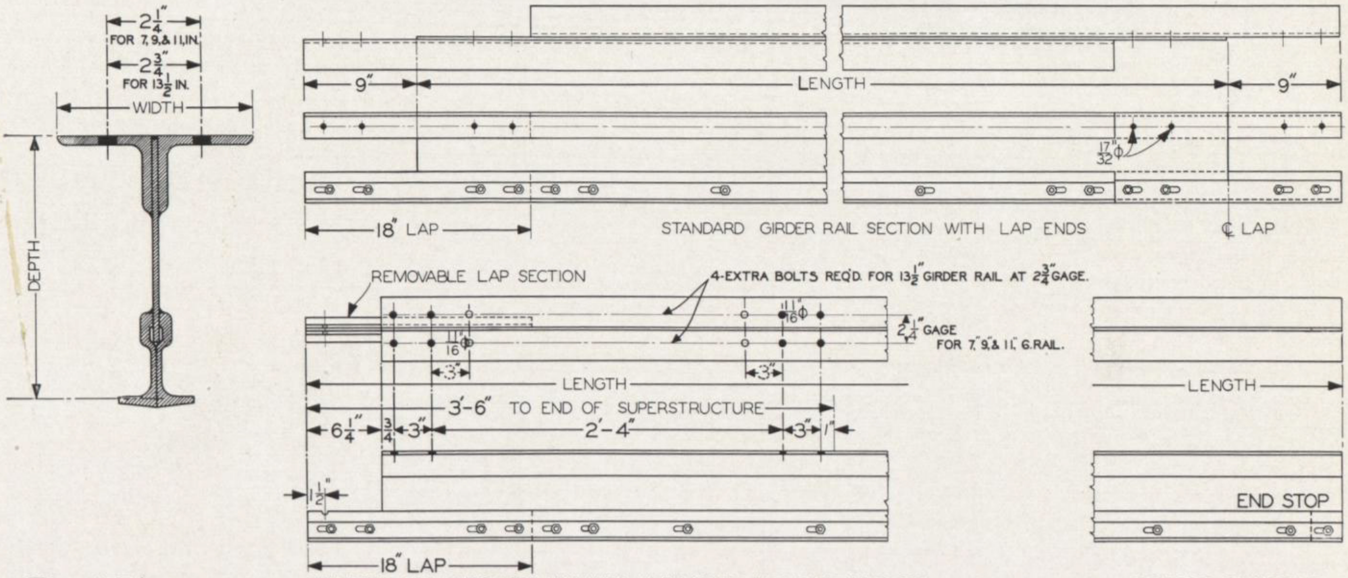

2¼" FOR 7, 9, & 11, IN.
2¾" FOR 13½ IN.
WIDTH
DEPTH
9"
LENGTH
9"
17/32 φ
18" LAP
STANDARD GIRDER RAIL SECTION WITH LAP ENDS
℄ LAP
REMOVABLE LAP SECTION
4-EXTRA BOLTS REQ'D. FOR 13½" GIRDER RAIL AT 2¾" GAGE.
11/16 φ
2¼" GAGE FOR 7, 9, & 11, G. RAIL.
3"
LENGTH
3'-6" TO END OF SUPERSTRUCTURE
6¼"
¾
3"
2'-4"
3"
1"
1½"
LENGTH
END STOP
18" LAP
STANDARD CONNECTION FOR SWITCHES, INTERLOCKS, LIFTS, TURNTABLES, ECT.
STANDARD SQUARE END

Fig. 177A

Bolted connections are often used when Truss or Girder rail may be placed directly against supporting beams. Time is saved in erection by using clamping connections which are adjustable to meet building variations.

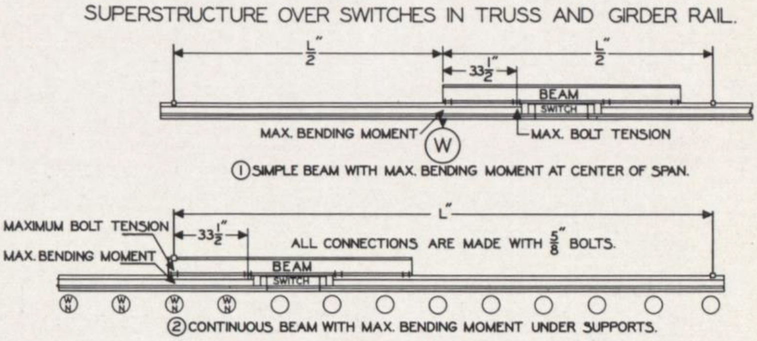
The supporting strength of flat flanges on built up sections where clamps are used depends upon the thickness of the flange. See Fig. 178B. The tabulation below gives the carrying capacities for a single clamp on flanges of various thicknesses. On page 176 is given the carrying capacities of No. 479 and No. 480 flange clamp for different width flanges. Allowance is made for a large factor of safety. The load carrying capacities of bolts are given at the right of the same diagram.

Connection to Switches and Other Trackage Units

Where switches occur in runs of Truss and Girder Rail, I-Beams may be bolted directly to the flanges of the connecting sections. These beams running over the switches furnish continuous beam strength permitting the use of continuous beam construction past switches on straight runs, and at the same time the beam furnishes direct support for the switches or cross-overs. See the drawing at the right.

The location of bolt holes in sections of Truss and Girder Rail which have an end connection for switches and interlocks of various types has been standardized as is shown in the drawings at the right. All connecting bolts are $\frac{5}{8}$-inch which is the size used in the assembly of the supporting steel work.

The tabulation, right, shows the proper sizes of I-beam to use over switches with the different sizes of Truss and Girder Rail. The size of flange angles, section moduli of rails and beams with the total bolt tension and number of bolts required for each connection is given. The gauge lines are standard for the beams used in each case. These standards were used to lay out and tabulate the superstructure for standard switch groups shown in the following pages.


SUPERSTRUCTURE OVER SWITCHES IN TRUSS AND GIRDER RAIL.
L/2"
33½"
L/2"
BEAM
SWITCH
MAX. BENDING MOMENT
W
MAX. BOLT TENSION
① SIMPLE BEAM WITH MAX. BENDING MOMENT AT CENTER OF SPAN.
MAXIMUM BOLT TENSION
MAX. BENDING MOMENT
33½"
L"
ALL CONNECTIONS ARE MADE WITH ⅝" BOLTS.
BEAM
SWITCH
W/N
② CONTINUOUS BEAM WITH MAX. BENDING MOMENT UNDER SUPPORTS.

SUPERSTRUCTURE BEAM SIZES AND BOLTS

TRUSS OR GIRDER RAIL						BEAM		TOTAL	NO. $\frac{5}{8}$"	GAUGE
			FLANGE							
DEPTH	KIND	SIZE	ANGLES	WIDTH	Z	SIZE	Z	TENSION	BOLTS	OF HOLES
7"	TRUSS	STANDARD	$2\times1\frac{1}{2}\times\frac{1}{4}$	4"	6.45	7"@15.3	10.34	3080 LBS.	8	$2\frac{1}{4}$"
7"	"	WIDE FLANGE	$2\frac{1}{2}\times1\frac{1}{2}\times\frac{1}{4}$	5"	6.58	"	"	3140 "	"	"
7"	GIRDER	STANDARD	$2\frac{1}{2}\times1\frac{1}{2}\times\frac{1}{4}$	5.19"	7.11	"	"	3400 "	"	"
7"	"	WIDE FLANGE	$3\times2\times\frac{1}{4}$	6.19"	7.24	"	"	3460 "	"	"
9"	"	STANDARD	$3\times2\times\frac{1}{4}$	6.19"	10.38	7"@17.5	11.11	4960 "	"	"
9"	"	WIDE FLANGE	$3\frac{1}{2}\times2\frac{1}{2}\times\frac{5}{16}$	7.19"	10.97	"	"	5240 "	"	"
11"	"	STANDARD	$3\frac{1}{2}\times2\frac{1}{2}\times\frac{5}{16}$	7.19"	14.73	8"@20.5	15.05	7000 "	"	"
11"	"	WIDE FLANGE	$4\times3\times\frac{5}{16}$	8.19"	14.93	"	"	7130 "	"	"
$13\frac{1}{2}$"	"	STANDARD	$4\times3\times\frac{5}{16}$	8.19"	20.20	10"@25.4	24.42	9650 "	12	$2\frac{3}{4}$"
$13\frac{1}{2}$"	"	WIDE FLANGE	$5\times3\times\frac{5}{16}$	10.19"	23.21	"	"	11080 "	"	"

Fig. 177B

Framing Over Standard Switch Groups

Standardization of bolt locations together with the position of switches in the various groupings shown on pages 19, 20 and 21 makes it possible to lay out superstructure for all of these standard groupings and detail and estimate the superstructure for all the groups and for every depth of Truss and Girder Rail The steel plan for all three curve series is shown below. On the opposite page the weight of steel with connecting bolts and washers required are shown. All switch brackets, curve supports, curve and switch hanger bolts are also given. This facilitates making erection cost estimates of all the standard groups.

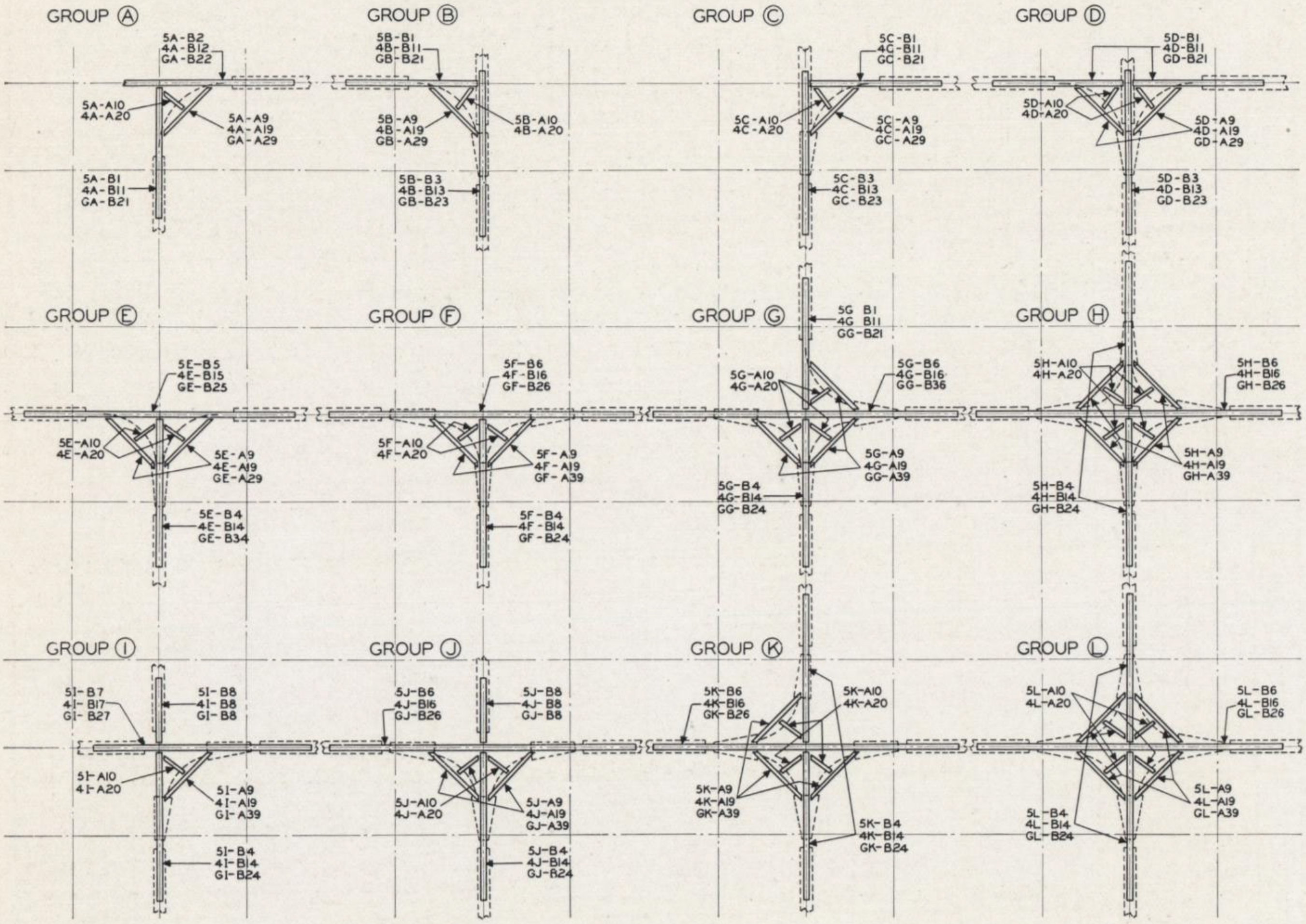


Fig. 178A

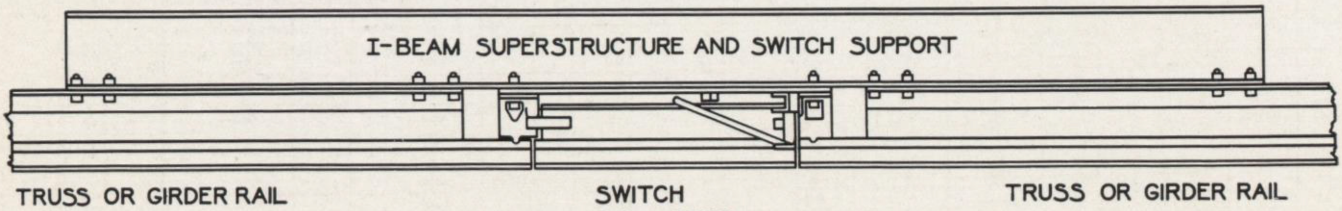


Fig. 178B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Fig. 179 Superstructure for standard switch groupings and different depths of truss and girder rail.

STANDARD CURVE SERIES	7" GIRDER OR TRUSS RAIL	GROUP	5A	5B	5C	5D	5E	5F	5G	5H	5I	5J	5K	5L
		WT. STEEL	480	330	330	520	505	515	700	760	445	575	710	760
		BOLT LIST	23 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 4 16 BEV. WASH. 25 L. WASHERS	31 - 5/8 x 1 1/2 3 - 5/8 x 2 1/2 1 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 38 L. WASHERS	31 - 5/8 x 1 1/2 3 - 5/8 x 2 1/2 1 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 38 L. WASHERS	38 - 5/8 x 1 1/2 4 - 5/8 x 2 6 - 5/8 x 2 1/2 2 - 5/8 x 4 4 - 5/8 x 9 32 BEV. WASH. 52 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 40 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 4 - 5/8 x 2 1/2 2 - 5/8 x 4 12 - 5/8 x 9 24 BEV. WASH. 50 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 7 - 5/8 x 2 1/2 3 - 5/8 x 4 12 - 5/8 x 9 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 8 - 5/8 x 2 1/2 4 - 5/8 x 4 16 - 5/8 x 9 32 BEV. WASH. 70 L. WASHERS	37 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 2 1/2 1 - 5/8 x 4 12 - 5/8 x 9 32 BEV. WASH. 57 L. WASHERS	38 - 5/8 x 1 1/2 6 - 5/8 x 2 6 - 5/8 x 2 1/2 2 - 5/8 x 4 16 - 5/8 x 9 32 BEV. WASH. 66 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 10 - 5/8 x 2 1/2 3 - 5/8 x 4 20 - 5/8 x 9 32 BEV. WASH. 75 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 12 - 5/8 x 2 1/2 4 - 5/8 x 4 20 - 5/8 x 9 32 BEV. WASH. 78 L. WASHERS
	9" GIRDER RAIL	GROUP	5A	5B	5C	5D	5E	5F	5G	5H	5I	5J	5K	5L
		WT. STEEL	535	365	365	565	555	565	770	825	500	640	780	830
		BOLT LIST	23 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 6 16 BEV. WASH. 25 L. WASHERS	31 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 4 1/2 1 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 38 L. WASHERS	31 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 4 1/2 1 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 38 L. WASHERS	38 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 2 1/2 2 - 5/8 x 4 1/2 2 - 5/8 x 6 4 - 5/8 x 11 32 BEV. WASH. 52 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 40 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 4 1/2 2 - 5/8 x 6 12 - 5/8 x 11 24 BEV. WASH. 50 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 4 - 5/8 x 2 1/2 3 - 5/8 x 4 1/2 3 - 5/8 x 6 12 - 5/8 x 11 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 4 - 5/8 x 2 1/2 4 - 5/8 x 4 1/2 4 - 5/8 x 6 16 - 5/8 x 11 32 BEV. WASH. 70 L. WASHERS	37 - 5/8 x 1 1/2 4 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 4 1/2 1 - 5/8 x 6 12 - 5/8 x 11 32 BEV. WASH. 57 L. WASHERS	38 - 5/8 x 1 1/2 6 - 5/8 x 2 2 - 5/8 x 2 1/2 4 - 5/8 x 4 1/2 2 - 5/8 x 6 16 - 5/8 x 11 32 BEV. WASH. 66 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 4 - 5/8 x 2 1/2 6 - 5/8 x 4 1/2 3 - 5/8 x 6 20 - 5/8 x 11 32 BEV. WASH. 75 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 4 - 5/8 x 2 1/2 8 - 5/8 x 4 1/2 4 - 5/8 x 6 20 - 5/8 x 11 32 BEV. WASH. 78 L. WASHERS
	11" GIRDER RAIL	GROUP	5A	5B	5C	5D	5E	5F	5G	5H	5I	5J	5K	5L
		WT. STEEL	615	430	430	650	635	665	890	960	605	760	915	970
		BOLT LIST	23 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 8 16 BEV. WASH. 25 L. WASHERS	31 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 6 1/2 1 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 38 L. WASHERS	31 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 6 1/2 1 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 38 L. WASHERS	38 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 2 1/2 2 - 5/8 x 6 1/2 2 - 5/8 x 8 4 - 5/8 x 14 32 BEV. WASH. 52 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 40 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 6 1/2 2 - 5/8 x 8 12 - 5/8 x 14 24 BEV. WASH. 50 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 4 - 5/8 x 2 1/2 3 - 5/8 x 6 1/2 3 - 5/8 x 8 12 - 5/8 x 14 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 4 - 5/8 x 2 1/2 4 - 5/8 x 6 1/2 4 - 5/8 x 8 16 - 5/8 x 14 32 BEV. WASH. 70 L. WASHERS	37 - 5/8 x 1 1/2 4 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 6 1/2 1 - 5/8 x 8 12 - 5/8 x 14 32 BEV. WASH. 57 L. WASHERS	38 - 5/8 x 1 1/2 6 - 5/8 x 2 2 - 5/8 x 2 1/2 4 - 5/8 x 6 1/2 2 - 5/8 x 8 16 - 5/8 x 14 32 BEV. WASH. 66 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 4 - 5/8 x 2 1/2 6 - 5/8 x 6 1/2 3 - 5/8 x 8 20 - 5/8 x 14 32 BEV. WASH. 75 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 4 - 5/8 x 2 1/2 8 - 5/8 x 6 1/2 4 - 5/8 x 8 20 - 5/8 x 14 32 BEV. WASH. 78 L. WASHERS
	13 1/2" GIRDER RAIL	GROUP	5A	5B	5C	5D	5E	5F	5G	5H	5I	5J	5K	5L
		WT. STEEL	730	515	515	790	765	810	1090	1160	750	935	1115	1170
		BOLT LIST	7 - 5/8 x 1 1/2 24 - 5/8 x 2 2 - 5/8 x 2 1/2 1 - 5/8 x 10 1/2 24 BEV. WASH. 33 L. WASHERS	7 - 5/8 x 1 1/2 36 - 5/8 x 2 2 - 5/8 x 2 1/2 1 - 5/8 x 9 1 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 50 L. WASHERS	7 - 5/8 x 1 1/2 36 - 5/8 x 2 2 - 5/8 x 2 1/2 1 - 5/8 x 9 1 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 50 L. WASHERS	6 - 5/8 x 1 1/2 52 - 5/8 x 2 4 - 5/8 x 2 1/2 2 - 5/8 x 9 2 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 48 BEV. WASH. 68 L. WASHERS	8 - 5/8 x 1 1/2 38 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 52 L. WASHERS	8 - 5/8 x 1 1/2 38 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 9 2 - 5/8 x 10 1/2 12 - 5/8 x 18 1/2 36 BEV. WASH. 62 L. WASHERS	7 - 5/8 x 1 1/2 54 - 5/8 x 2 4 - 5/8 x 2 1/2 3 - 5/8 x 9 3 - 5/8 x 10 1/2 12 - 5/8 x 18 1/2 48 BEV. WASH. 80 L. WASHERS	4 - 5/8 x 1 1/2 58 - 5/8 x 2 4 - 5/8 x 2 1/2 4 - 5/8 x 9 4 - 5/8 x 10 1/2 16 - 5/8 x 18 1/2 48 BEV. WASH. 86 L. WASHERS	5 - 5/8 x 1 1/2 52 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 9 1 - 5/8 x 10 1/2 12 - 5/8 x 18 1/2 48 BEV. WASH. 73 L. WASHERS	6 - 5/8 x 1 1/2 54 - 5/8 x 2 2 - 5/8 x 2 1/2 4 - 5/8 x 9 2 - 5/8 x 10 1/2 16 - 5/8 x 18 1/2 48 BEV. WASH. 82 L. WASHERS	7 - 5/8 x 1 1/2 54 - 5/8 x 2 4 - 5/8 x 2 1/2 6 - 5/8 x 9 3 - 5/8 x 10 1/2 20 - 5/8 x 18 1/2 48 BEV. WASH. 91 L. WASHERS	4 - 5/8 x 1 1/2 58 - 5/8 x 2 4 - 5/8 x 2 1/2 8 - 5/8 x 9 4 - 5/8 x 10 1/2 20 - 5/8 x 18 1/2 48 BEV. WASH. 94 L. WASHERS
SHORT RADIUS CURVE SERIES	7" GIRDER OR TRUSS RAIL	GROUP	4A	4B	4C	4D	4E	4F	4G	4H	4I	4J	4K	4L
		WT. STEEL	435	310	310	460	435	445	600	650	405	515	610	650
		BOLT LIST	23 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 4 16 BEV. WASH. 25 L. WASHERS	31 - 5/8 x 1 1/2 3 - 5/8 x 2 1/2 1 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 38 L. WASHERS	31 - 5/8 x 1 1/2 3 - 5/8 x 2 1/2 1 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 38 L. WASHERS	38 - 5/8 x 1 1/2 4 - 5/8 x 2 6 - 5/8 x 2 1/2 2 - 5/8 x 4 4 - 5/8 x 9 32 BEV. WASH 52 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 40 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 4 - 5/8 x 2 1/2 2 - 5/8 x 4 12 - 5/8 x 9 24 BEV. WASH. 50 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 7 - 5/8 x 2 1/2 3 - 5/8 x 4 12 - 5/8 x 9 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 8 - 5/8 x 2 1/2 4 - 5/8 x 4 16 - 5/8 x 9 32 BEV. WASH. 70 L. WASHERS	37 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 2 1/2 1 - 5/8 x 4 12 - 5/8 x 9 32 BEV. WASH. 57 L. WASHERS	38 - 5/8 x 1 1/2 6 - 5/8 x 2 6 - 5/8 x 2 1/2 2 - 5/8 x 4 16 - 5/8 x 9 32 BEV. WASH. 66 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 10 - 5/8 x 2 1/2 3 - 5/8 x 4 20 - 5/8 x 9 32 BEV. WASH. 75 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 12 - 5/8 x 2 1/2 4 - 5/8 x 4 20 - 5/8 x 9 32 BEV. WASH. 78 L. WASHERS
	9" GIRDER RAIL	GROUP	4A	4B	4C	4D	4E	4F	4G	4H	4I	4J	4K	4L
		WT. STEEL	485	340	340	495	470	505	680	725	480	585	690	730
		BOLT LIST	23 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 6 16 BEV. WASH. 25 L. WASHERS	31 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 4 1/2 1 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 38 L. WASHERS	31 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 4 1/2 1 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 38 L. WASHERS	38 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 2 1/2 2 - 5/8 x 4 1/2 2 - 5/8 x 6 4 - 5/8 x 11 32 BEV. WASH. 52 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 40 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 4 1/2 2 - 5/8 x 6 12 - 5/8 x 11 24 BEV. WASH. 50 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 4 - 5/8 x 2 1/2 3 - 5/8 x 4 1/2 3 - 5/8 x 6 12 - 5/8 x 11 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 4 - 5/8 x 2 1/2 4 - 5/8 x 4 1/2 4 - 5/8 x 6 16 - 5/8 x 11 32 BEV. WASH. 70 L. WASHERS	37 - 5/8 x 1 1/2 4 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 4 1/2 1 - 5/8 x 6 12 - 5/8 x 11 32 BEV. WASH. 57 L. WASHERS	38 - 5/8 x 1 1/2 6 - 5/8 x 2 2 - 5/8 x 2 1/2 4 - 5/8 x 4 1/2 2 - 5/8 x 6 16 - 5/8 x 11 32 BEV. WASH. 66 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 4 - 5/8 x 2 1/2 6 - 5/8 x 4 1/2 3 - 5/8 x 6 20 - 5/8 x 11 32 BEV. WASH. 75 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 4 - 5/8 x 2 1/2 8 - 5/8 x 4 1/2 4 - 5/8 x 6 20 - 5/8 x 11 32 BEV. WASH. 78 L. WASHERS
	11" GIRDER RAIL	GROUP	4A	4B	4C	4D	4E	4F	4G	4H	4I	4J	4K	4L
		WT. STEEL	575	415	415	595	555	580	795	840	560	680	805	850
		BOLT LIST	23 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 8 16 BEV. WASH. 25 L. WASHERS	31 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 6 1/2 1 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 38 L. WASHERS	31 - 5/8 x 1 1/2 2 - 5/8 x 2 1/2 1 - 5/8 x 6 1/2 1 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 38 L. WASHERS	38 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 2 1/2 2 - 5/8 x 6 1/2 2 - 5/8 x 8 4 - 5/8 x 14 32 BEV. WASH. 52 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 40 L. WASHERS	32 - 5/8 x 1 1/2 2 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 6 1/2 2 - 5/8 x 8 12 - 5/8 x 14 24 BEV. WASH. 50 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 4 - 5/8 x 2 1/2 3 - 5/8 x 6 1/2 3 - 5/8 x 8 12 - 5/8 x 14 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 4 - 5/8 x 2 1/2 4 - 5/8 x 6 1/2 4 - 5/8 x 8 16 - 5/8 x 14 32 BEV. WASH. 70 L. WASHERS	37 - 5/8 x 1 1/2 4 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 6 1/2 1 - 5/8 x 8 12 - 5/8 x 14 32 BEV. WASH. 57 L. WASHERS	38 - 5/8 x 1 1/2 6 - 5/8 x 2 2 - 5/8 x 2 1/2 4 - 5/8 x 6 1/2 2 - 5/8 x 8 16 - 5/8 x 14 32 BEV. WASH. 66 L. WASHERS	39 - 5/8 x 1 1/2 6 - 5/8 x 2 4 - 5/8 x 2 1/2 6 - 5/8 x 6 1/2 3 - 5/8 x 8 20 - 5/8 x 14 32 BEV. WASH. 75 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 4 - 5/8 x 2 1/2 8 - 5/8 x 6 1/2 4 - 5/8 x 8 20 - 5/8 x 14 32 BEV. WASH. 78 L. WASHERS
	13 1/2" GIRDER RAIL	GROUP	4A	4B	4C	4D	4E	4F	4G	4H	4I	4J	4K	4L
		WT. STEEL	685	480	480	695	665	705	940	1000	670	835	975	1015
		BOLT LIST	7 - 5/8 x 1 1/2 24 - 5/8 x 2 2 - 5/8 x 2 1/2 1 - 5/8 x 10 1/2 24 BEV. WASH. 33 L. WASHERS	7 - 5/8 x 1 1/2 36 - 5/8 x 2 2 - 5/8 x 2 1/2 1 - 5/8 x 9 1 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 50 L. WASHERS	7 - 5/8 x 1 1/2 36 - 5/8 x 2 2 - 5/8 x 2 1/2 1 - 5/8 x 9 1 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 50 L. WASHERS	6 - 5/8 x 1 1/2 52 - 5/8 x 2 4 - 5/8 x 2 1/2 2 - 5/8 x 9 2 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 48 BEV. WASH. 68 L. WASHERS	8 - 5/8 x 1 1/2 38 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 52 L. WASHERS	8 - 5/8 x 1 1/2 38 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 9 2 - 5/8 x 10 1/2 12 - 5/8 x 18 1/2 36 BEV. WASH. 62 L. WASHERS	7 - 5/8 x 1 1/2 54 - 5/8 x 2 4 - 5/8 x 2 1/2 3 - 5/8 x 9 3 - 5/8 x 10 1/2 12 - 5/8 x 18 1/2 48 BEV. WASH. 80 L. WASHERS	4 - 5/8 x 1 1/2 58 - 5/8 x 2 4 - 5/8 x 2 1/2 4 - 5/8 x 9 4 - 5/8 x 10 1/2 16 - 5/8 x 18 1/2 48 BEV. WASH. 86 L. WASHERS	5 - 5/8 x 1 1/2 52 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 9 1 - 5/8 x 10 1/2 12 - 5/8 x 18 1/2 48 BEV. WASH. 73 L. WASHERS	6 - 5/8 x 1 1/2 54 - 5/8 x 2 2 - 5/8 x 2 1/2 4 - 5/8 x 9 2 - 5/8 x 10 1/2 16 - 5/8 x 18 1/2 48 BEV. WASH. 82 L. WASHERS	7 - 5/8 x 1 1/2 54 - 5/8 x 2 4 - 5/8 x 2 1/2 6 - 5/8 x 9 3 - 5/8 x 10 1/2 20 - 5/8 x 18 1/2 48 BEV. WASH. 91 L. WASHERS	4 - 5/8 x 1 1/2 58 - 5/8 x 2 4 - 5/8 x 2 1/2 8 - 5/8 x 9 4 - 5/8 x 10 1/2 20 - 5/8 x 18 1/2 48 BEV. WASH. 94 L. WASHERS
SHIFT SWITCH CURVE SERIES	7" GIRDER OR TRUSS RAIL	GROUP	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL
		WT. STEEL	415	285	285	410	380	430	565	615	385	500	585	620
		BOLT LIST	22 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 4 16 BEV. WASH. 24 L. WASHERS	30 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 2 1/2 1 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 37 L. WASHERS	30 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 2 1/2 1 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 37 L. WASHERS	36 - 5/8 x 1 1/2 8 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 4 4 - 5/8 x 9 32 BEV. WASH. 50 L. WASHERS	30 - 5/8 x 1 1/2 4 - 5/8 x 2 2 - 5/8 x 2 1/2 2 - 5/8 x 4 4 - 5/8 x 9 24 BEV. WASH. 40 L. WASHERS	30 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 2 1/2 12 - 5/8 x 9 24 BEV. WASH. 50 L. WASHERS	40 - 5/8 x 1 1/2 8 - 5/8 x 2 5 - 5/8 x 2 1/2 1 - 5/8 x 4 12 - 5/8 x 9 32 BEV. WASH. 65 L. WASHERS	32 - 5/8 x 1 1/2 14 - 5/8 x 2 8 - 5/8 x 2 1/2 16 - 5/8 x 9 32 BEV. WASH. 70 L. WASHERS	36 - 5/8 x 1 1/2 6 - 5/8 x 2 2 - 5/8 x 2 1/2 12 - 5/8 x 9 32 BEV. WASH. 56 L. WASHERS	36 - 5/8 x 1 1/2 8 - 5/8 x 2 4 - 5/8 x 2 1/2 16 - 5/8 x 9 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 6 - 5/8 x 2 1/2 20 - 5/8 x 9 32 BEV. WASH. 72 L. WASHERS	32 - 5/8 x 1 1/2 14 - 5/8 x 2 8 - 5/8 x 2 1/2 20 - 5/8 x 9 32 BEV. WASH. 74 L. WASHERS
	9" GIRDER RAIL	GROUP	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL
		WT. STEEL	465	320	320	460	435	485	645	695	455	560	670	700
		BOLT LIST	22 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 6 16 BEV. WASH. 24 L. WASHERS	30 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 4 1/2 1 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 37 L. WASHERS	30 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 4 1/2 1 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 37 L. WASHERS	36 - 5/8 x 1 1/2 8 - 5/8 x 2 2 - 5/8 x 4 1/2 2 - 5/8 x 6 4 - 5/8 x 11 32 BEV. WASH. 50 L. WASHERS	30 - 5/8 x 1 1/2 4 - 5/8 x 2 2 - 5/8 x 4 1/2 2 - 5/8 x 6 4 - 5/8 x 11 24 BEV. WASH. 40 L. WASHERS	30 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 4 1/2 12 - 5/8 x 11 24 BEV. WASH. 50 L. WASHERS	40 - 5/8 x 1 1/2 8 - 5/8 x 2 5 - 5/8 x 4 1/2 1 - 5/8 x 6 12 - 5/8 x 11 32 BEV. WASH. 65 L. WASHERS	32 - 5/8 x 1 1/2 14 - 5/8 x 2 8 - 5/8 x 4 1/2 16 - 5/8 x 11 32 BEV. WASH. 70 L. WASHERS	36 - 5/8 x 1 1/2 6 - 5/8 x 2 2 - 5/8 x 4 1/2 12 - 5/8 x 11 32 BEV. WASH. 56 L. WASHERS	36 - 5/8 x 1 1/2 8 - 5/8 x 2 4 - 5/8 x 4 1/2 16 - 5/8 x 11 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 6 - 5/8 x 4 1/2 20 - 5/8 x 11 32 BEV. WASH. 72 L. WASHERS	32 - 5/8 x 1 1/2 14 - 5/8 x 2 8 - 5/8 x 4 1/2 20 - 5/8 x 11 32 BEV. WASH. 74 L. WASHERS
	11" GIRDER RAIL	GROUP	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL
		WT. STEEL	555	385	385	560	500	565	760	805	550	670	780	815
		BOLT LIST	22 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 8 16 BEV. WASH. 24 L. WASHERS	30 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 6 1/2 1 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 37 L. WASHERS	30 - 5/8 x 1 1/2 2 - 5/8 x 2 1 - 5/8 x 6 1/2 1 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 37 L. WASHERS	36 - 5/8 x 1 1/2 8 - 5/8 x 2 2 - 5/8 x 6 1/2 2 - 5/8 x 8 4 - 5/8 x 14 32 BEV. WASH. 50 L. WASHERS	30 - 5/8 x 1 1/2 4 - 5/8 x 2 2 - 5/8 x 6 1/2 2 - 5/8 x 8 4 - 5/8 x 14 24 BEV. WASH. 40 L. WASHERS	30 - 5/8 x 1 1/2 4 - 5/8 x 2 4 - 5/8 x 6 1/2 12 - 5/8 x 14 24 BEV. WASH. 50 L. WASHERS	40 - 5/8 x 1 1/2 8 - 5/8 x 2 5 - 5/8 x 6 1/2 1 - 5/8 x 8 12 - 5/8 x 14 32 BEV. WASH. 65 L. WASHERS	32 - 5/8 x 1 1/2 14 - 5/8 x 2 8 - 5/8 x 6 1/2 16 - 5/8 x 14 32 BEV. WASH. 70 L. WASHERS	36 - 5/8 x 1 1/2 6 - 5/8 x 2 2 - 5/8 x 6 1/2 12 - 5/8 x 14 32 BEV. WASH. 56 L. WASHERS	36 - 5/8 x 1 1/2 8 - 5/8 x 2 4 - 5/8 x 6 1/2 16 - 5/8 x 14 32 BEV. WASH. 64 L. WASHERS	36 - 5/8 x 1 1/2 10 - 5/8 x 2 6 - 5/8 x 6 1/2 20 - 5/8 x 14 32 BEV. WASH. 72 L. WASHERS	32 - 5/8 x 1 1/2 14 - 5/8 x 2 8 - 5/8 x 6 1/2 20 - 5/8 x 14 32 BEV. WASH. 74 L. WASHERS
	13 1/2" GIRDER RAIL	GROUP	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL
		WT. STEEL	665	455	455	660	600	690	880	970	675	815	950	985
		BOLT LIST	6 - 5/8 x 1 1/2 26 - 5/8 x 2 1 - 5/8 x 10 1/2 24 BEV. WASH. 32 L. WASHERS	6 - 5/8 x 1 1/2 38 - 5/8 x 2 1 - 5/8 x 9 1 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 49 L. WASHERS	6 - 5/8 x 1 1/2 38 - 5/8 x 2 1 - 5/8 x 9 1 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 49 L. WASHERS	4 - 5/8 x 1 1/2 56 - 5/8 x 2 2 - 5/8 x 9 2 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 48 BEV. WASH. 66 L. WASHERS	6 - 5/8 x 1 1/2 40 - 5/8 x 2 2 - 5/8 x 9 2 - 5/8 x 10 1/2 4 - 5/8 x 18 1/2 36 BEV. WASH. 52 L. WASHERS	6 - 5/8 x 1 1/2 40 - 5/8 x 2 4 - 5/8 x 9 12 - 5/8 x 18 1/2 36 BEV. WASH. 62 L. WASHERS	8 - 5/8 x 1 1/2 56 - 5/8 x 2 5 - 5/8 x 9 1 - 5/8 x 10 1/2 12 - 5/8 x 18 1/2 48 BEV. WASH. 81 L. WASHERS	62 - 5/8 x 2 8 - 5/8 x 9 16 - 5/8 x 18 1/2 48 BEV. WASH. 86 L. WASHERS	4 - 5/8 x 1 1/2 54 - 5/8 x 2 2 - 5/8 x 9 12 - 5/8 x 18 1/2 48 BEV. WASH. 72 L. WASHERS	4 - 5/8 x 1 1/2 56 - 5/8 x 2 4 - 5/8 x 9 16 - 5/8 x 18 1/2 48 BEV. WASH. 80 L. WASHERS	4 - 5/8 x 1 1/2 58 - 5/8 x 2 6 - 5/8 x 9 20 - 5/8 x 18 1/2 48 BEV. WASH. 88 L. WASHERS	62 - 5/8 x 2 8 - 5/8 x 9 20 - 5/8 x 18 1/2 48 BEV. WASH. 90 L. WASHERS

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Typical Installation Details. I.

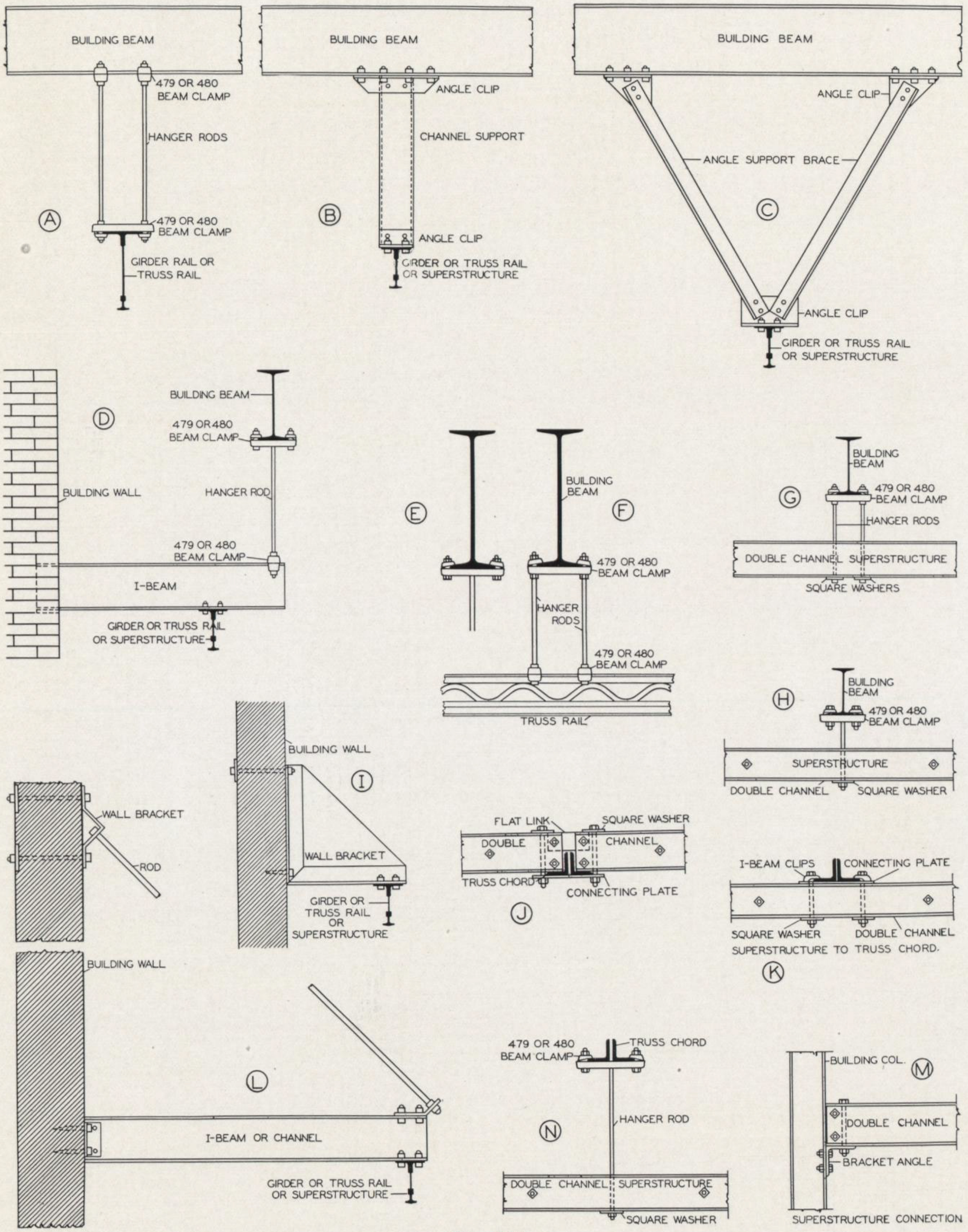


Fig. 180

Typical Installation Details. II.

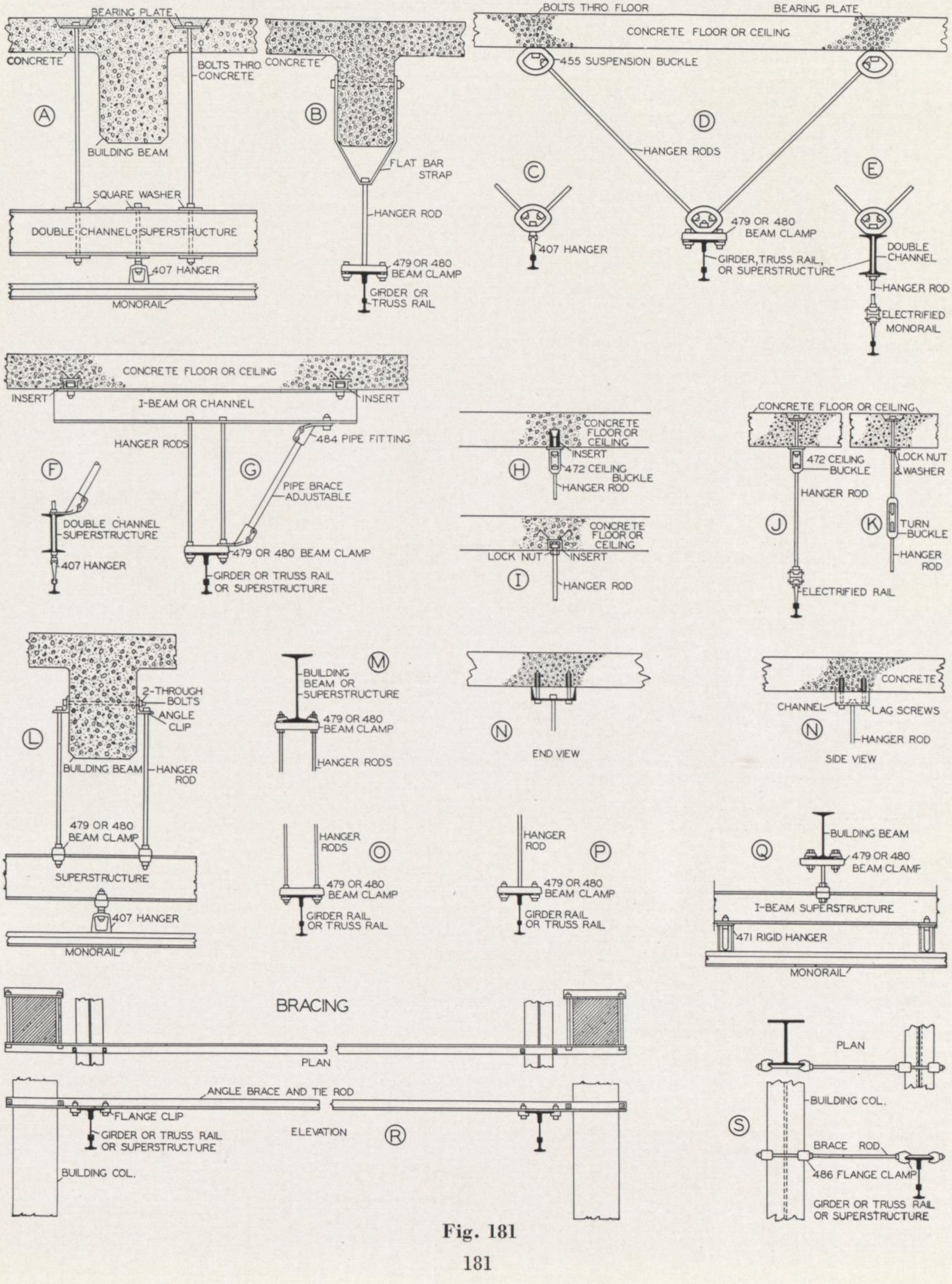


Fig. 181

Typical Installation Details. III.

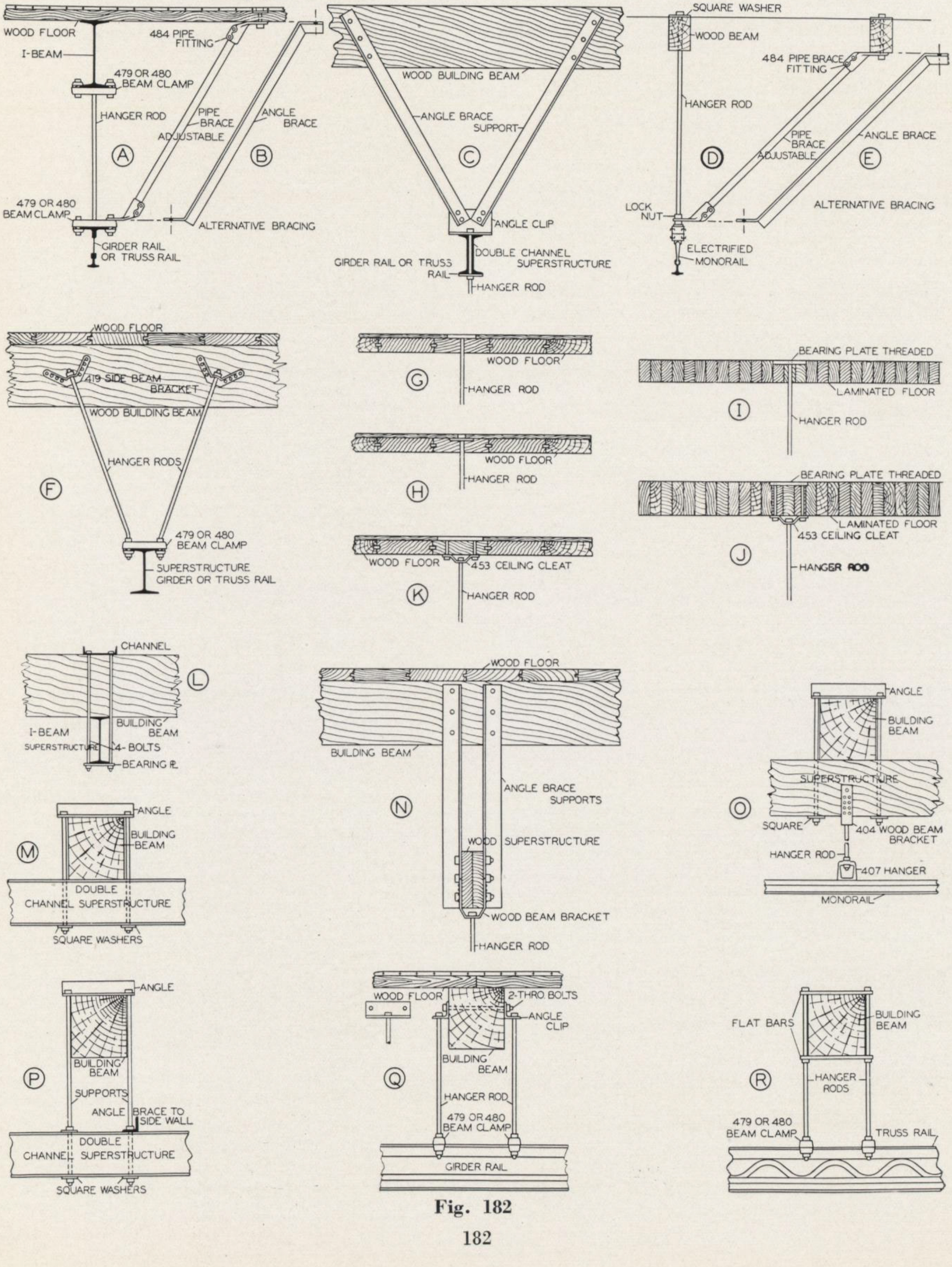


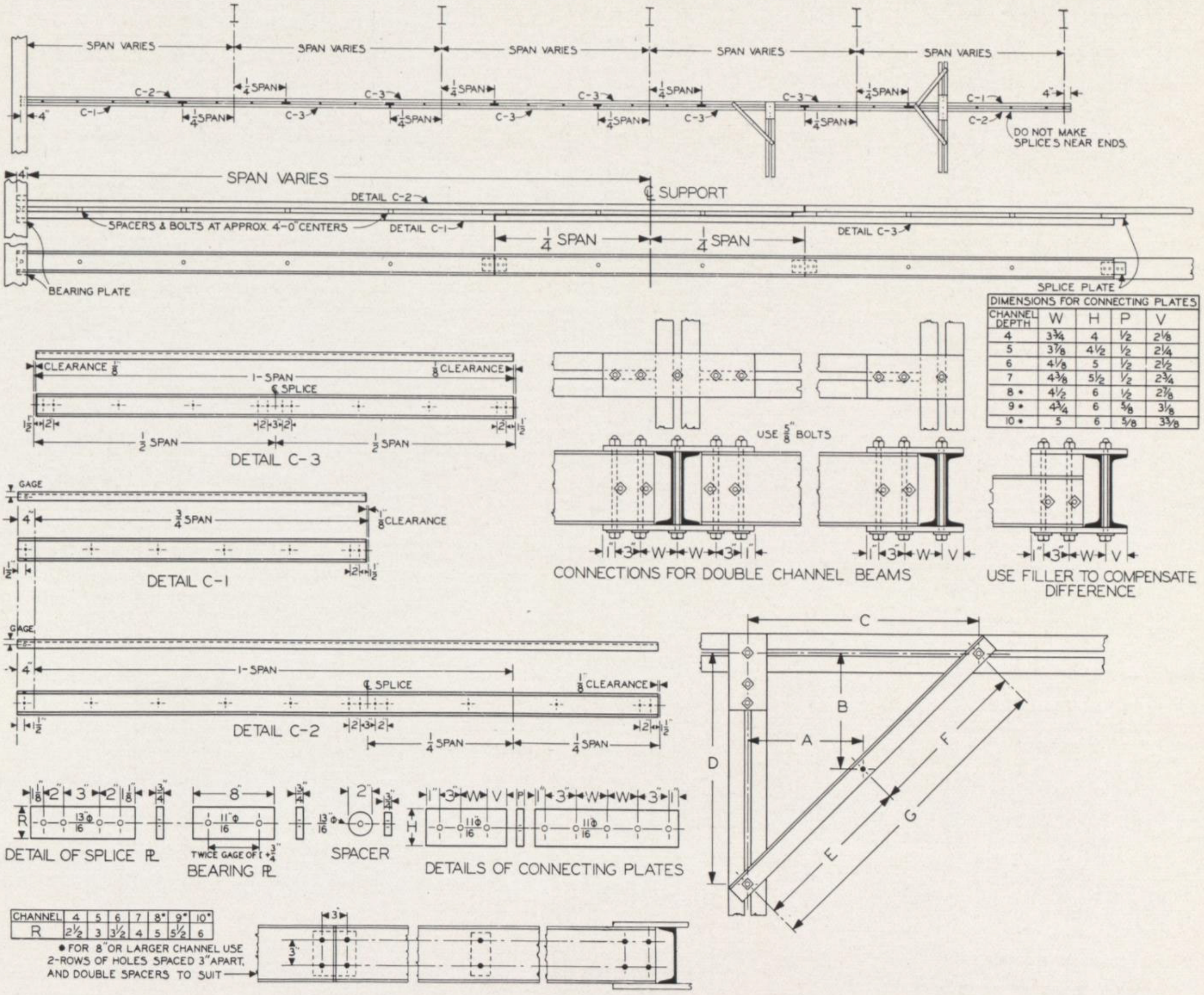
Fig. 182

Double Channel Superstructure

Two channels back to back with ¾ inch spacers make an excellent superstructure for the support of long runs of standard MonoRail. Hanger Bolts are supported from washers at the top and extend between the channels to the forged hangers below. It is not necessary that hangers be located at given points since hanger bolts may pass between the channels anywhere except where there is a splice plate. The bottom flanges of the channels make a rigid flat surface to which switches and cross-overs may be bolted by inexpensive connections. Hanger rods to supporting beams in the building may be run down between the channels at any point along the line.

This makes careful exact measurements of every beam location unnecessary, sometimes saving expensive delays which might otherwise be necessary to get complete accurate information before completing superstructure layouts. The method of framing for connecting runs likewise allows flexibility as the superstructure for a branch line may be attached anywhere except where a splice plate or hanger rod might interfere.

The general type of framing recommended is shown below. Laps may be located anywhere between the quarter point of the span as shown, to one-sixth of the span away from the support. When the laps are located in this way and detailed as shown below, the carrying capacity is increased 25% over superstructure with butt joints at every support. Load Tables for Double Channels are given on page 189.



DIMENSIONS FOR CONNECTING PLATES				
CHANNEL DEPTH	W	H	P	V
4	3¾	4	½	2⅛
5	3⅞	4½	½	2¼
6	4⅛	5	½	2½
7	4⅜	5½	½	2¾
8 •	4½	6	½	2⅞
9 •	4¾	6	⅝	3⅛
10 •	5	6	⅝	3⅜

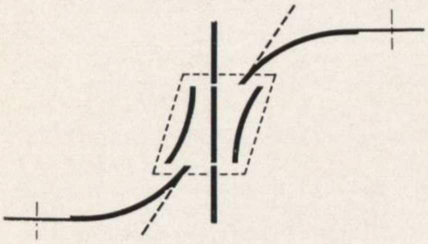
CHANNEL	4	5	6	7	8•	9•	10•
R	2½	3	3½	4	5	5½	6

• FOR 8" OR LARGER CHANNEL USE 2-ROWS OF HOLES SPACED 3" APART, AND DOUBLE SPACERS TO SUIT

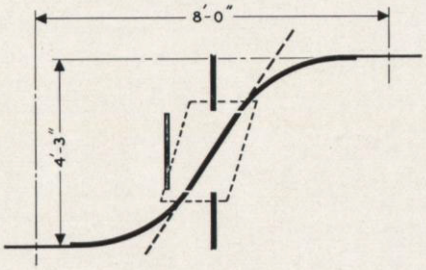
Fig. 183

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings

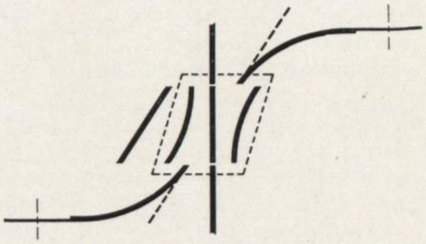
Special Equipment Assembled from Standard Parts



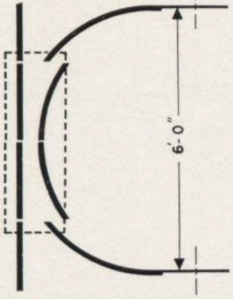
DOUBLE RIGHT HAND GLIDE SWITCH



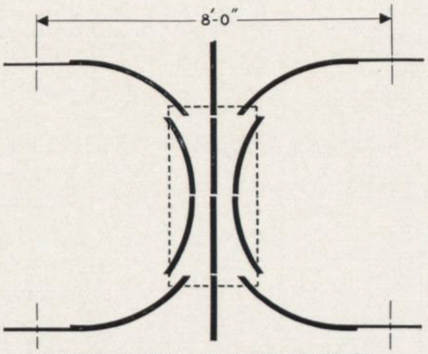
GLIDE TYPE 30° CROSS OVER



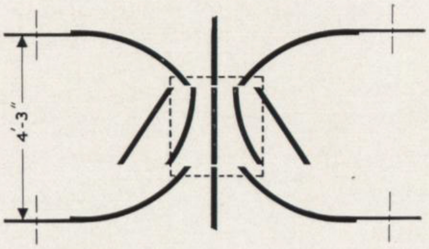
GLIDE TYPE COMBINED DOUBLE RIGHT AND CROSS OVER SWITCH



COMBINED RIGHT AND LEFT GLIDE SWITCHES ON SINGLE MOUNTING PLATE HEEL TO HEEL WITHOUT INTERVENING RAIL SECTION

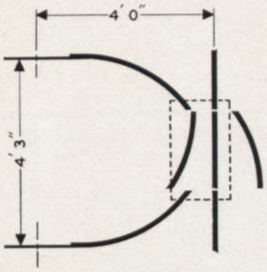


COMBINED THREE WAY GLIDE SWITCHES ON SINGLE MOUNTING PLATE HEEL TO HEEL WITHOUT INTERVENING RAIL SECTION

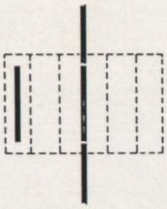


COMBINED THREE WAY GLIDE SWITCH AND CROSS OVER FOR COMPACT ARRANGEMENT OF MONORAIL BRANCHES

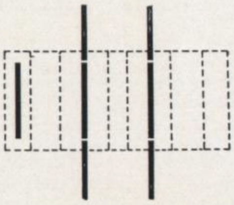
Fig. 184A



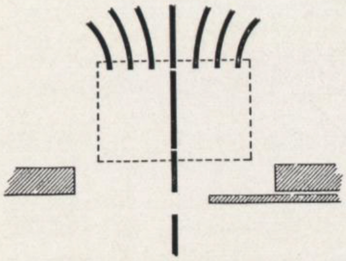
COMBINED RIGHT AND LEFT GLIDE TYPE SWITCH IN STORAGE AREA PERMITS CHANGING DIRECTION OF CURVES WITHOUT LOSS OF SPACE



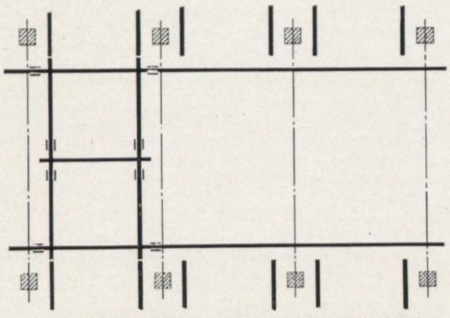
GLIDE TYPE SHIFT OUT SECTION SHIFTS LOADED TROLLEYS OUT OF LINE FOR INSPECTION OR REMOVAL WITHOUT INTERRUPTING OPERATIONS



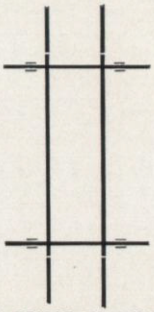
GLIDE TYPE SHIFT OUT SECTION FOR DOUBLE LINES OF MONORAIL



GLIDE TYPE TRANSFER SWITCH SERVES CLOSE GROUPS OF RADIATING TRACKS WITHOUT LOSS OF HEADROOM AND EXPENSE OF CRANE



CRANE TRANSFER FOR STORAGE BUILDING ONE TRANSFER CRANE SERVES ALL BAYS



DOUBLE BRIDGE TRANSFER CRANE MAY BE USED WHERE LOADS ARE LIGHT AND MANY TO BE HANDLED. ALSO FOR FOUR POINT SUSPENSION RACKS

Fig. 184B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Special Glide Switches

Glide type switches are more compact in construction than tongue switches. They are often used in conjunction with tongue switches at critical points to obtain compactness in trackage arrangement. Glide switch standard parts may also be assembled into a variety of special arrangements to meet a problem requiring compactness at the same time accommodating the flow of the main traffic along particular lines of MonoRail.

The graphic layouts on the opposite page illustrate a number of special switches of this type. Below is an application taken from a layout which shows the intersection of two main traffic lines of MonoRail in a track storage and inspection area. The rails on the shift sections of the two special switches are arranged differently in each case to give preference to operating the switch for different lines of traffic.

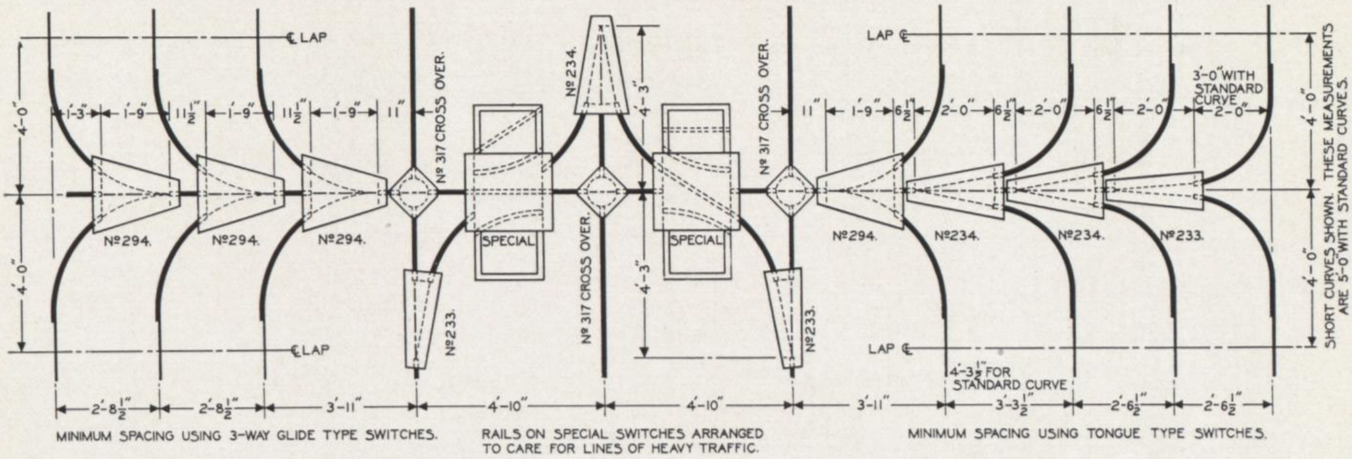


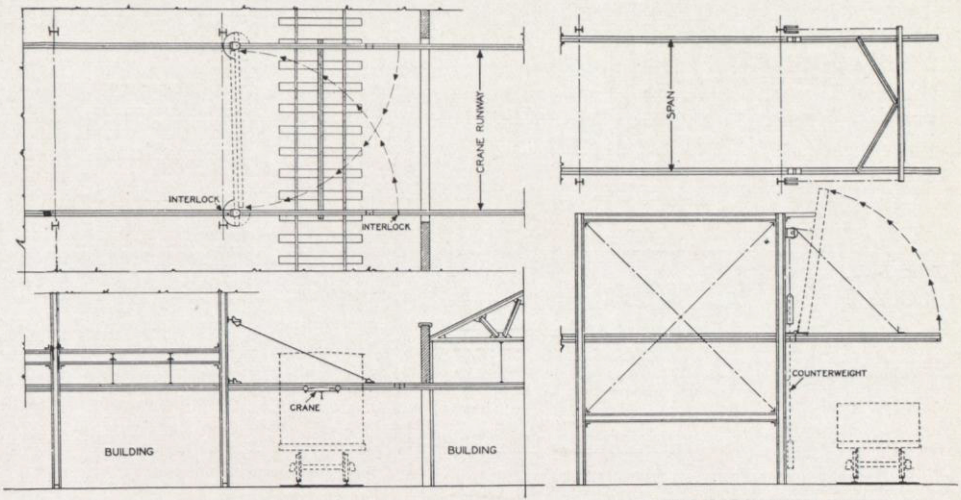
Fig. 185A

Shift-out sections for inspection lines built on the glide switch principle are often more convenient than a side track and may be arranged for single or double lines of MonoRail. In double lines they may be operated as a transfer without interrupting traffic. They may also be used as a transfer where radiating tracks are compactly grouped and within the range of movement not greater than two or three feet as is illustrated in the graph above.

Transfer cranes of special construction using standard end trucks, interlocks or other standard parts are also arranged where conditions require. Two combinations are shown in the drawings opposite.

Railways or passageways sometimes prevent the normal layout for the use of cranes. The left hand drawing opposite shows crane runway rails consisting of interlocking jibs with 11" bridge and deep interlock to permit the passage of crane wheels. These jibs are swung out of the way when the crane runway is not in use, clearing the bay for cars, trucks or other operations. This method also applies where heavy overhead cranes must be used and where otherwise there would be interference at times.

Below is shown a vertical hinged runway as built to lower crane runway rails over a gondola where a crane could be used for unloading purposes.



ILLUSTRATING METHOD FOR SPANNING PASSAGE WAY WITH SWINGING CRANE RUNWAY.

VERTICAL LIFTING CRANE RUNWAY WITH COUNTERWEIGHTS.

Fig. 185B

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Dipping and Lifting Machines

MonoRail lifting and dipping devices are called upon to perform a variety of operations and to meet the customer's conditions as to power available, headroom and clearances at the point where the equipment is to be installed, lifting speed, speed control, timing of dipping operations, length of drop and other conditions incidental to the manufacturing problem. This variety of conditions cannot always be met by the standard lifting and dipping equipment shown on pages 123 to 125 and modifications or new designs are sometimes necessary. Some of these modifications which have been furnished to meet a customer's particular problem are shown in the drawings which follow.

Often there are points in a MonoRail system where much lifting must be done. It is usually quicker and less expensive to put in a plunger type MonoRail lift operated by air or electricity at such points rather than to have hand or power hoists on each separate trolley to do the lifting. Even with hand hoists on each trolley time enough may be saved in the lifting operation to justify the moderate expense of a plunger lift.

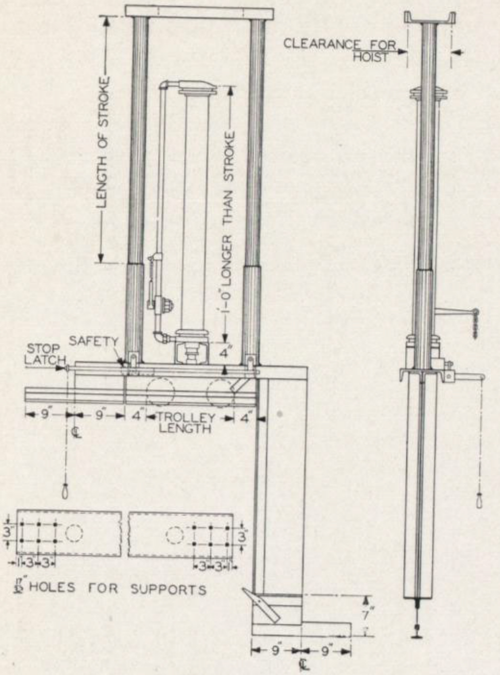
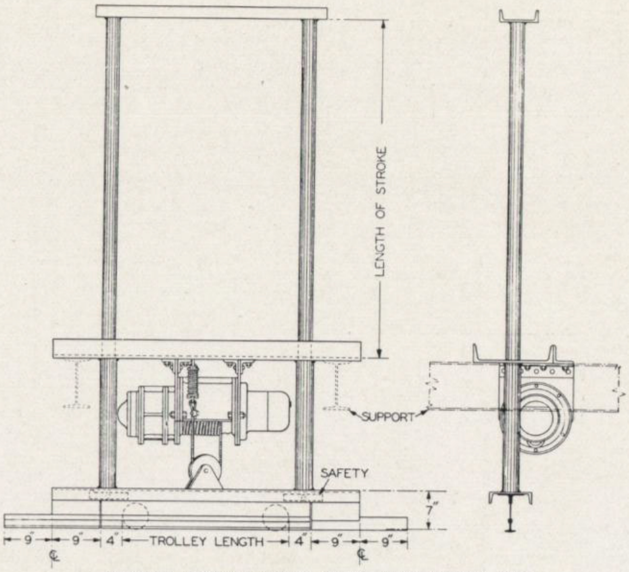


Fig. 186A



PLUNGER DIPPING & LIFTING DEVICE WITH ELECTRIC HOIST

Fig. 186B

Two modifications of the standard plunger type of hoisting device are shown here. One shows an electric hoist replacing the cylinder type of air hoist generally used. The other shows a modification for lifting or lowering loads through comparatively short distances between two MonoRail levels. The height of lift possible is usually limited due to the extension of the plunger type guides above the line of rail which increases with the length of the lift.

The plunger type of lift is also adapted to rapid dipping operations where the materials to be dipped are suspended from short racks or trolleys. When racks are long and are liable to have an off balance load, the guides must be proportionally longer than in short balanced loads. For this reason it is sometimes a question as to which type of dip or lifter to use and this can only be answered by a study of the conditions of a particular problem.

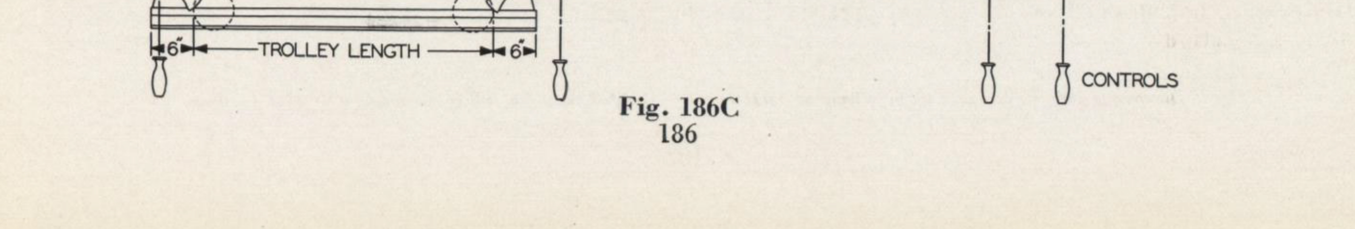


Fig. 186C

Long racks and heavier loads are handled better with suspension type dips and lifts, and where headroom is limited and plunger type dips cannot be used, some suspension type will usually apply. Suspension dips may be operated by electric hoists or air motor hoists, but where air pressure is available, the cylinder type of air hoist is generally used. Volatile painting or other mixtures of an explosive or corrosive nature usually require the use of air cylinder hoists, but sometimes an electric hoist is used by placing it at a distance away from the dipping machine. This is illustrated in the arrangement below.

An extended double drum hoist can be arranged into a very compact type of dipping machine as space or convenience may require as is shown in the following design.

A simplified variation of the dipping machine shown on catalog page 125 operated with an air cylinder hoist may be used when the dip is in a straight run of MonoRail which will permit placing the cylinder over one approach.

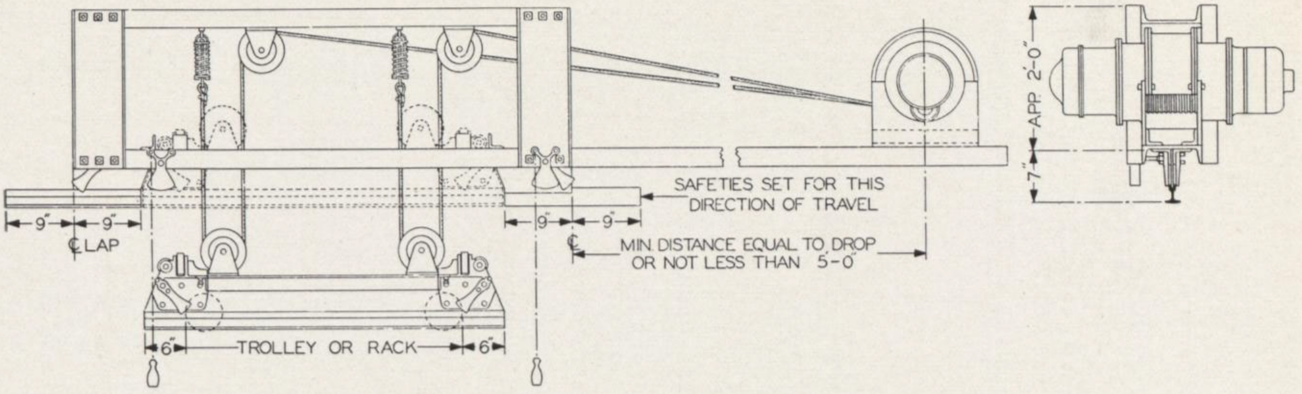

9"
9"
℄ LAP
6"
TROLLEY OR RACK
6"
9"
9"
℄
SAFETIES SET FOR THIS DIRECTION OF TRAVEL
MIN. DISTANCE EQUAL TO DROP OR NOT LESS THAN 5-0"
APP. 2'-0"
7"

Fig. 187A

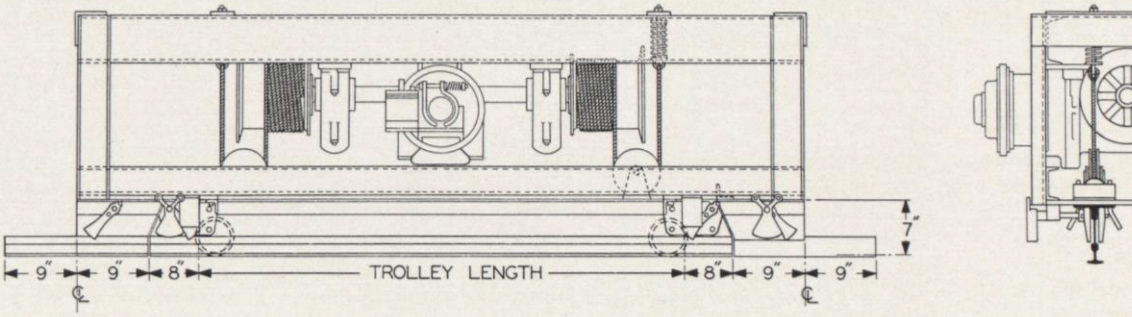


Fig. 187B

Since dipping machines must be made up to meet specific conditions as to loading, speed, power available, clearances, size of rack and length of drop, it is not possible to give many definite measurements on these drawings which are made to offer suggestions. MonoRail engineers will furnish suggestions and designs without charge for MonoRail dipping or lifting machines on problems submitted to them.

All open rail ends on dipping and lifting machines are guarded by safety stops. The safeties used may be automatic or hand operated. Where automatic safeties can be used, slight depressions are placed in the rail flanges on the lowering section to spot the trolley wheels and prevent the trolley from shifting until the automatic safeties operate as the load starts to move. Care must be exercised to see that the trolleys are not stopped partly on and partly off the lowering section.

Hand operated safety stops are usually recommended as they tend to force the placing of the load in proper position on the lowering section of rail. With hand operated safeties the load is stopped at the approach end of the lowering section and cannot be moved forward until the safety rope is pulled. It is then run onto the dip section and against the stop at the farther end. This stops it in the proper position on the lowering section for the operation of the machine. Automatic floating safeties or dogs used in conjunction with hand operated safeties prevent back movement of the trolleys into open rail ends, but allow the trolley to move forward without interruption.

Dimensions given on this page are for estimating purposes only. Certified blueprints will be furnished for working drawings.

Automatic Dipping and Lifting Machines

Lifting and dipping machines employing electric hoists which will complete a prearranged cycle of operations have been furnished and may be arranged to meet a variety of conditions.

In dipping operations the hoist may be arranged with push button control for lowering a load quickly to a given dipping level. Time relays then operate, allowing the load to remain as long as required according to the time adjustment of the relay. At the end of the time the electric hoist automatically raises the loaded trolley at a given speed to the level of the track system. The dipped product is removed and replaced with a trolley load of undipped material, completing a cycle of operations.

Lowering or raising operations working automatically through a cycle are also furnished for certain conditions. The accompanying diagram of a double guide elevator shows the arrangement used for lifting and discharging a loaded trolley and automatically returning the lift section to the lower MonoRail level ready to receive another load.

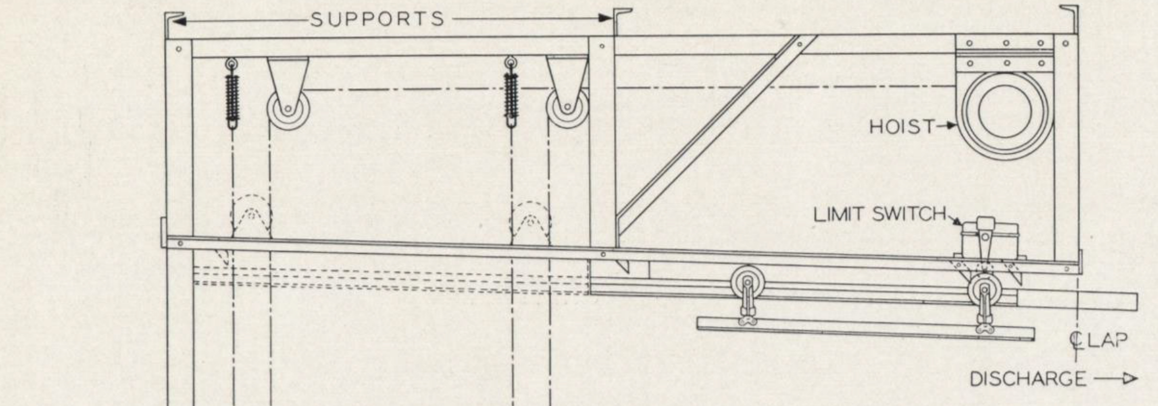

SUPPORTS
HOIST
LIMIT SWITCH
℄LAP
DISCHARGE
NOTE
SINGLE OR DOUBLE CABLE SUSPENSION MAY BE USED. DEPENDING ON WEIGHT OF LOAD. AND LIFTING SPEED REQUIRED.
FEED
9"
9"
6"
TROLLEY LENGTH
6"
℄LAP

Fig. 188

The loaded trolley from the lower level MonoRail system is run onto the lifting section. The operator pushes the electric hoist control button starting the hoist motor and lifting the load to the upper rail level where it stops with the lifting section sloping toward the discharge end. As the lift section registers at the upper track level, an upper limit switch stops the hoist motor and a dog which holds the trolley on the sloping section is kicked out of the way allowing the trolley to run off by gravity. When the loaded trolley has cleared the lift by about two or three feet a lug placed on the trolley yoke trips a hatchway limit switch set over the rail. This reverses the hoist motor and lowers the lift section to its original position. As it registers, a lower limit switch stops the hoist motor, the safety stop is automatically lifted, the cycle is completed and the lift is ready for another loaded trolley.

Lifts may be arranged to run automatically through a cycle of lowering loads in a similar manner. MonoRail engineers will study your dipping or lifting problem upon request and co-operate with you in finding the most economical method of handling.

CAPACITIES OF **CHANNELS** LOADS DISTRIBUTED

FIXED LATERALLY

SPAN IN FEET	3″		4″		5″		6″		7″		8″		9″		10″		12″	
	4.1#	5.0#	5.4#	6.25#	6.7#	9.0#	8.2#	10.5#	9.8#	12.25#	11.5#	13.75#	13.4#	15.0#	15.3#	20.0#	20.7#	25.0#
4	3200	3600	5700	6200	8900	10500	13000	15100	18100	20700	24200	26900	31500	33800	40000	47000	64000	72000
6	2100	2400	3800	4100	5900	7000	8700	10100	12100	13800	16100	17900	21000	22500	27000	31000	43000	48000
8	1600	1800	2900	3100	4400	5300	6300	7600	9000	10300	12100	13400	15800	16900	20000	24000	32000	36000
10	1300	1400	2300	2500	3600	4200	5200	6000	7200	8300	9700	10700	12600	13500	16000	19000	26000	29000
12	1100	1200	1900	2100	3000	3500	4300	5000	6000	6900	8100	8900	10500	11300	13000	16000	21000	24000
14	900	1000	1600	1800	2500	3000	3700	4300	5100	5900	6900	7700	9000	9700	12000	14000	18000	21000
16					2200	2600	3300	3800	4500	5200	6100	6800	7900	8400	10000	12000	16000	18000
18					2000	2300	2900	3400	4000	4600	5400	6000	7000	7500	9000	11000	14000	16000
20					1800	2100	2600	3000	3600	4100	4800	5400	6300	6800	8000	9000	13000	14000
22							2400	2700	3300	3800	4400	4900	5700	6100	7000	8000	12000	13000
24							2200	2500	3000	3400	4000	4500	5300	5600	7000	8000	11000	12000

FREE LATERALLY

SPAN IN FEET	3″		4″		5″		6″		7″		8″		9″		10″		12″	
	4.1#	5.0#	5.4#	6.25#	6.7#	9.0#	8.2#	10.5#	9.8#	12.25#	11.5#	13.75#	13.4#	15.0#	15.3#	20.0#	20.7#	25.0#
4	2300	2600	4300	4800	7200	8800	11000	13100	15900	18500	22000	24700	29300	31700	38000	45000	63000	71000
6	940	1100	2060	2300	3500	4500	5700	6900	8500	10000	12000	13500	16200	17600	22000	26000	37000	42000
8				1620	1680	2400	2950	4210	5020	5770	7810	8070	9900	10700	14000	16000	23000	27000
10								1980	2540	3260	3980	4820	6000	6640	8320	10600	15700	18000
12													3510	3980	5030	6880	10250	12290
14																	7670	8170

CAPACITIES OF **I-BEAMS** LOADS DISTRIBUTED

FIXED LATERALLY

SPAN IN FEET	3″		4″		5″		6″		7″		8″		9″		10″		12″	
	5.7#	6.5#	7.7#	9.5#	10.0#	12.25#	12.5#	14.5#	15.3#	17.5#	18.4#	20.5#	21.8#	25.0#	25.4#	30.0#	31.8#	35.0#
4	5000	5400	9000	10100	14500	16200	21800	23800	31000	33400	42700	45200	56600	60900	73300	80100		
6	3300	3600	6000	6700	9700	10800	14500	15900	20700	22200	28500	30100	37700	40600	48800	53400	72000	76000
8	2500	2700	4500	5000	7300	8100	10900	11900	15500	16700	21300	22600	28300	30500	36600	40100	54000	57000
10	2000	2200	3600	4000	5800	6500	8700	9500	12400	13300	17100	18100	22600	24400	29300	32000	43000	45000
12	1700	1800	3000	3400	4800	5400	7300	7900	10300	11100	14200	15100	18900	20300	24400	26700	36000	38000
14		1500	2600	2900	4200	4600	6200	6800	8900	9500	12200	12900	16200	17400	20900	22900	31000	32000
16					3600	4100	5500	6000	7700	8300	10700	11300	14200	15200	18300	20000	27000	28000
18					3200	3600	4800	5300	6900	7400	9500	10000	12600	13500	16300	17800	24000	25000
20					2900	3200	4400	4800	6200	6700	8500	9000	11300	12200	14700	16000	22000	23000
22							4000	4300	5600	6100	7800	8200	10300	11100	13300	14600	20000	21000
24							3600	4000	5200	5600	7100	7500	9400	10200	12200	13400	18000	19000

FREE LATERALLY

SPAN IN FEET	3″		4″		5″		6″		7″		8″		9″		10″		12″	
	5.7#	6.5#	7.7#	9.5#	10.0#	12.25#	12.5#	14.5#	15.3#	17.5#	18.4#	20.5#	21.8#	25.0#	25.4#	30.0#	31.8#	35.0#
4	4600	5000	8600	10000	14300	16100	21800	23800	31000	33400	42700	45200	56600	60900	73300	80100		
6	2500	2800	4900	5600	8400	9500	13100	14500	19300	20900	27200	28900	36800	39900	48400	53400	72000	76000
8		1700	3000	3500	5400	6100	8500	9500	12800	14000	18400	19700	25200	27500	33600	37100	51000	54000
10		1500	1700	2280	3380	4200	5900	6600	9000	9800	13100	14000	18100	19900	24500	27100	37000	39000
12		820	1020	1510	2220	2880	4180	4670	6400	7100	9600	10300	13500	14800	18400	20500	28000	30000
14			580	910	1600	1910	2880	3500	4670	5180	7170	7790	10790	11300	14100	15800	22000	23000
16						1280	1950	2880	3280	3740	5350	5820	7820	8660	10960	12300	17000	18000
18									2260	2610	3870	4250	5920	6350	8460	10110	13390	13950
20											2680	3000	4320	4890	6470	7390	10870	11410
22														3520	4740	5580	8360	8860
24																3780	6210	6650

Fig. 189

CAPACITIES OF DOUBLE CHANNELS, LOADS DISTRIBUTED.

FIXED LATERALLY												
SIZE OF BEAM	LBS. PER FOOT	SPAN IN FEET										
		4	6	8	10	12	14	16	18	20	22	24
3″	4.1	6600	4400	3200								
	5.0	7400	4800	3600								
4″	5.4	11400	7600	5600	4600							
	6.25	12400	8400	6200	5000							
5″	6.7	17800	11800	8800	7200	6000	5000	4400				
	9.0	21200	14200	10600	8400	7000	6000	5200	4600			
6″	8.2	26000	17400	13000	10400	8600	7400	6600	5800			
	10.5	30200	20000	15000	12000	10000	8600	7600	6800	6000		
7″	9.8	36200	24000	18000	14400	12000	10400	9000	8000	7200		
	12.25	41200	27400	20600	16400	13800	11800	10400	9200	8200	7600	
8″	11.5	48400	32400	24200	19400	16200	13800	12200	10800	9600	8800	
	13.75	53800	35800	26800	21600	18000	15400	13400	12000	10800	9800	
9″	13.4	63000	42000	31600	25200	21000	18000	15800	14000	12600	11400	10600
	15.0	67600	45000	33800	27000	22600	19400	16800	15000	13600	12200	11200
10″	15.3	80200	53600	40200	32200	26800	23000	20000	17800	16000	14000	14000
	20.0	94200	62800	47000	37600	31400	27000	23600	21000	18800	18000	16000
12″	20.7	128200	85400	64000	51200	42800	36600	32000	28400	25600	23200	21400
	25.0	143600	95600	71800	57400	47800	41000	35800	31800	28800	26000	24000

FREE LATERALLY												
SIZE OF BEAM	LBS. PER FOOT	SPAN IN FEET										
		4	6	8	10	12	14	16	18	20	22	24
3″	4.1	6600	3730	2310								
	5.0	7400	4150	2660								
4″	5.4	11400	6670	4220	2910							
	6.25	12400	7540	4860	3360							
5″	6.7	17800	10800	7110	5070	3610	2490	1720				
	9.0	21200	13220	8900	6250	4550	3310	2387	1670			
6″	8.2	26000	16360	11060	7880	5720	4230	3160	2230			
	10.5	30200	19780	13040	9360	6920	5190	3940	2890	2000		
7″	9.8	36200	22920	15640	11232	8300	6280	4670	3400	2410		
	12.25	41200	26770	18480	13280	9980	7590	5850	4400	3210	2360	
8″	11.5	48400	31910	21900	15950	12000	9150	7030	5350	3970	2900	
	13.75	53800	35410	24440	17930	13540	9410	7950	6140	4470	3410	
9″	13.4	63000	42000	29450	21550	16420	12690	9970	7730	6020	4560	3500
	15.0	67600	45000	31600	23270	17810	13870	10720	7770	6720	5100	3880
10″	15.3	80200	53600	38270	28340	21790	17110	13520	10790	8580	6480	5530
	20.0	94200	62800	45210	33580	26060	20600	16400	12710	10570	7890	6820
12″	20.7	128200	85400	62720	47510	36680	29020	23420	19030	15510	12600	10310
	25.0	143600	95600	71080	53380	41540	33130	26780	21910	18090	14720	12120

NOTE.—USE ½ OF THE VALUES IN THIS TABLE WHEN LOADS ARE CONCENTRATED AT CENTER OF SPAN.
WHEN CONTINUOUS BEAM CONSTRUCTION WITH STRAIGHT RUNS OF STEEL THREE OR MORE SPANS LONG, DETAILED AS SHOWN ON PAGE 183 IS USED, THE LOADS SHOWN IN THIS TABLE MAY BE INCREASED 25%.

Fig. 190A

LOAD TABLES FOR WOOD BEAMS

BEAMS ARE COMMERCIAL SIZES, TABLES ARE BASED UPON 1200lb. FIBRE STRESS AND SIMPLE BEAM ACTION

CONCENTRATED LOADS										
SIZE OF TIMBER	SPAN IN FEET									
	6	8	10	12	14	16	18	20	22	24
2 X 6	678	503	396							
2 X 8	1205	898	712	586	495					
2 X 10		1448	1150	950	804	695	608			
2 X 12		2145	1681	1388	1197	1028	902	800	717	
2 X 14			2335	1932	1644	1425	1253	1115	1000	904
3 X 6	995	738	593							
3 X 8	1857	1382	1095	901	762					
3 X 10		2228	1768	1460	1237	1068	936			
3 X 12		3270	2597	2150	1825	1582	1388	1232	1105	
3 X 14			3590	2972	2530	2190	1928	1714	1540	1390
4 X 6	1394	1034	876							
4 X 8	2600	1938	1535	1263	1068					
4 X 10		3118	2475	2044	1734	1496	1310			
4 X 12		4610	3635	3015	2555	2212	1944	1725	1545	
4 X 14			5015	4160	3540	3070	2700	2400	2156	1946
4 X 16				5500	4690	4065	3580	3192	2870	2597
6 X 6	2192	1625	1284							
6 X 8	4085	3040	2410	1984	1676					
6 X 10		4900	3888	3210	2720	2350	2055			
6 X 12		7200	5760	4730	4015	3475	3054	2710	2425	
6 X 14			7900	6540	5530	4825	4242	3773	3385	3060
6 X 16				8650	7360	6400	5630	5010	4510	4085

UNIFORMLY DISTRIBUTED LOADS										
SIZE OF TIMBER	SPAN IN FEET									
	6	8	10	12	14	16	18	20	22	24
2 X 6	1130	838	661							
2 X 8	2011	1497	1186	976	825					
2 X 10		2413	1915	1582	1340	1158	1014			
2 X 12		3544	2818	2330	1978	1713	1503	1334	1195	
2 X 14			3890	3219	2739	2374	2088	1858	1667	1506
3 X 6	1658	1231	972							
3 X 8	3094	2302	1825	1502	1270					
3 X 10		3711	2947	2432	1261	1780	1559			
3 X 12		5448	4330	3582	3042	2635	2312	2052	1837	
3 X 14			5983	4956	4215	3651	3213	2856	2565	2318
4 X 6	2322	1723	1360							
4 X 8	4336	3227	2557	2105	1779					
4 X 10		5198	4125	3407	2888	2493	2183			
4 X 12		7687	6062	5014	4259	3686	3239	2873	2572	
4 X 14			8378	6936	5899	5117	4503	4001	3591	3243
4 X 16				9174	7814	6779	5971	5320	4784	4329
6 X 6	3652	2709	2139							
6 X 8	6806	5068	4013	3305	2792					
6 X 10		8162	6479	5348	4534	3915	3426			
6 X 12		11999	9531	7886	6694	7595	5089	4515	4042	
6 X 14			13172	10901	9272	8038	7069	6290	5642	5098
6 X 16				14418	12273	10656	9387	8360	7520	6804

THESE TABLES ARE FOR BEAMS FIXED LATERALLY SPANS TO RIGHT OF HEAVY VERTICAL LINES SHOULD NOT BE USED WITHOUT SIDE BRACING. LOADS TO THE RIGHT AND ABOVE THE DOTTED LINE WILL GIVE EXCESSIVE DEFLECTION.

Fig. 190B

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